Old CONTINUATION OF THE Series, BULLETIN OF THE NUTTALL ORNITHOLOGICAL CLUB Vol. XXXV

New

LIBRAN

The Auk

Quarterly Zournal of Ornithology

Vol. XXXV

OCTOBER, 1918

No. 4



PUBLISHED BY

The American Ornithologists' Union

CAMBRIDGE, MASS.

Entered as second-class mail matter in the Post Office at Boston, Mass. "Acceptance for mailing at special rate of postage provided for in Section 1103, Act of October 3, 1917, authorized on September 23, 1918."

## CONTENTS

THE NESTING GROUNDS AND NESTING HABITS OF THE SPOON-BILLED SANDPIPER. By Joseph Dison. (Plate V.)
A WINTER CROW ROOST. By Charles W. Townsend, M. D
THE PTERYLORIS OF THE WILD PIGEON. By Hubert Lyman Clark 416
SEXUAL SELECTION AND BIRD SONG. By Chauncey J. Hawkins
SOME ADDITIONS AND OTHER RECORDS NEW TO THE ORNITHOLOGY OF SOUTH
CAROLINA. By Arthur T. Wayne
LIST OF BIRDS COLLECTED ON THE HARVARD PERUVIAN EXPEDITION OF 1916. By Outram Bangs and G. K. Noble 442
NOTES ON NORTH AMERICAN BIRDS. VI. By Harry C. Oberholser 463
THE SUBSPRIES OF Larus hyperboreus GUNNERUS. By Harry C. Oberholser 467
General Notes.—Cause of the "Fishy" Flavor in Wild Ducks, 474; Cinnamon Teal (Querquedula cyanoptera) in North Dakota, 476; White-winged Scoter (Oidemia deglands) in South Carolina, 476; The Specific Name of the Glossy Ibis, 476; Nesting of the Bittern (Botawus lenitginosus) in the Delaware Valley, 477; Yellow-crowned Night Heron at Chicago, 477; The Black Vulture (Catharista urubu) in Indiana, 477; The Status of Buteo platypierus iowensis, 478; Flight of Horned Owis in Canada, 478; Picoides arcticus in Florida, 479; Early Nesting of the Northern Flleated Woodpecker in Pennsylvania, 479; Relative Length of the Intestinal Cacca in Trogons, 480; The Starling at Plattsburg, N. Y., 481; The Northernmost Record of Icterus pariserum, 481; The Slate-colored Junco (Junco hyemalis hyemalis) breeding near Boston, 482; Blue-winged Warbler Once More at South Sudbury, Mass, 482; A Winter Record of Bewick's Wren from Northern Virginia, 483; Russet-backed Thrush (Hylocichia ustulats ustulats) in New Mexico, 483; Notes from the Vicinity of Washington, D. C., 483; Scarcity of Birds in the Spring Migration of 1918, 484; Notes on Six Birds from Georgia, 485.
RECEIPT LITERATURE.— Dwight's Review of the Juncos, 486: Soper on the Birds of Edmonton, 489: Wood on the Birds of Aliger County, Michigan, 489; Bangs on New South American Birds, 490: Wetmore on Duck Sickness in Utah, 490; Mathews 'Birds of Australia,' 490; Grinnell on the Name of the American Barn Swallow, 491; Nichols on Some Aspects of Migration, 492; Birds of the National Parks, 492; Economic Ornithology in Recent Entomological Publications, 493; Centurus radiolatus in Relation to Cocoa in Jamaica, 495; Further Notes on the Possible Avian Distribution of Hog Cholera, 495; Recent Publications on Economic Ornithology, 496; The Ornithological Journals, 497; Ornithological Articles in Other Journals, 501; Publications Received, 503.
CORRESPONDENCE.—Concerning a Certain Tendency in Systematic Ornithology, 505; A Correction, 507.
Norms and Naws.— Uniform Nomenclature, 507; the Proposed 'Systema Avium,' 509; Enforcement of the Migratory Bird Treaty, 509; Obituary: Col. William Vincent Legg, 510; Dr. Robert Latehaw Walker, 511; Prof. Jonathan Young Stanton, 511; The Elliot Medal Award, 512; Dr. Richmond Appointed Associate Curator, 512; Annual Meeting of the B. O. U., 512; The Associates of the A. O. U., 513; Called to the Colors, 513; The Thirty-sixth Meeting of the A. O. U., 514.
INDEX
Еппата
DATES OF ISSUE
OFFICERS OF THE A. O. U. PAST AND PRESENT
CONTENTS
AMURANIE I AND A STAN OF STAN ASSESSED O

THE AUK, published quarterly as the Organ of the American Ornithologists' Union, is edited, beginning with volume for 1912, by Dr. Witmer Stone.

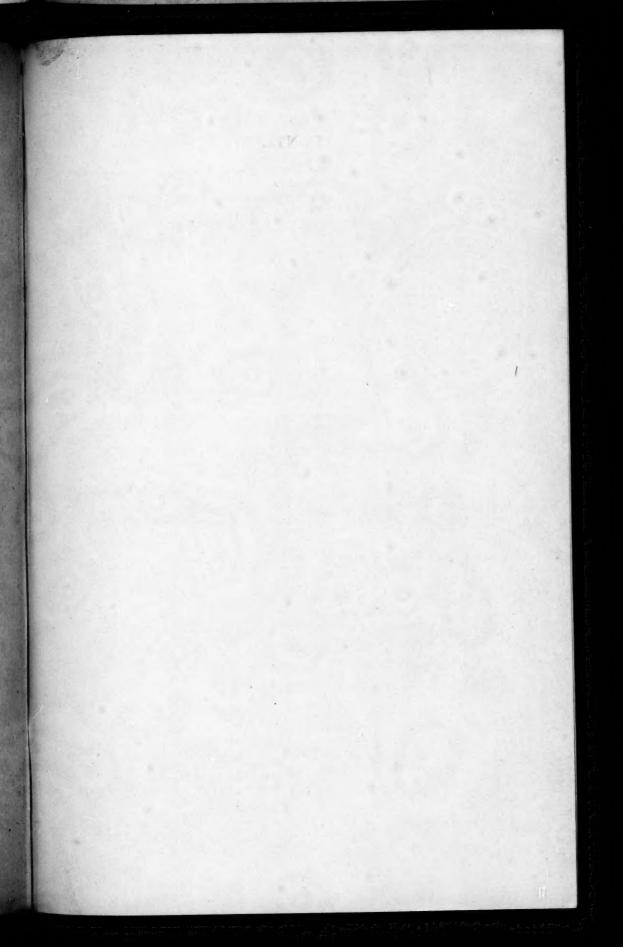
Terms:—\$3.00 a year, including postage, strictly in advance. Single numbers, 75 cents. Free to Honorary Fellows, and to Fellows, Members, and Associates of the A. O. U. not in arrears for dues.

THE OFFICE OF PUBLICATION IS AT 30 BOYLSTON ST., CAMBRIDGE, BOSTON,

Subscriptions may also be addressed to Dr. Jonathan Dwight, Business Manager, 134, W. 71st St., New York, N. Y. Foreign Subscribers may obtain "The Auk' through Witherby & Co., 326, High Holborn, London, W. C.

All articles and communications intended for publication and all books and publications for notice, may be sent to DR. WITMER STONE, ACADEMY OF NATURAL SCIENCES, LOGAN SQUARE, PHILADELPHIA, PA.

Manuscripts for general articles should reach the editor at least six weeks before the date of the number for which they are intended, and manuscripts for 'General Notes', 'Recent Literature', etc., not later than the first of the month preceding the date of the number in which it is desired they shall appear.





1



2

1. Breeding grounds of Spoon-billed Sandpiper at Providence Bay, Siberia, showing ice conditions June 21, 1913. Two nests of the Sandpiper were found at points near middle and at extreme left of photograph.

2. Nest and eggs of Spoon-billed Sandpiper (in situ), Providence Bay, Siberia, June 22, 1913.

# THE AUK:

## A QUARTERLY JOURNAL OF

## ORNITHOLOGY.

Vol. XXXV.

Остовек, 1918.

No. 4.

## THE NESTING GROUNDS AND NESTING HABITS OF THE SPOON-BILLED SANDPIPER.<sup>1</sup>

BY JOSEPH DIXON.

### Plate V.

The Spoon-billed Sandpiper (Eurynorhynchus pygmæus) is essentially an Asiatic species. There are but three specimens claimed to have been taken in North America, as far as known to the author, with some doubt attached to the locality of capture of one of these, which fact probably indicates that the occurrence of the bird in North America is irregular or casual. If the species nests on the Arctic shores of Alaska, or even habitually visits the region, it is reasonable to believe that the presence of so peculiar a bird would have been detected by more of the naturalists that have collected along the Alaska coast between Bering Strait and Point Barrow.

The Spoon-billed Sandpiper appears to be unknown to the American Eskimo, for the author was unable to find one among those interviewed who recognized it when skins were exhibited. On the other hand the "Chuckchies" of northeastern Siberia are familiar with the species, calling the bird by name when shown specimens.

The species is included in the A. O. U. 'Check-List' as a North

<sup>&</sup>lt;sup>1</sup> Contribution from the Museum of Vertebrate Zoölogy of the University of California.

American bird on the basis of a "summer" specimen taken by Captain Moore of the British Ship Plover, on Choris Peninsula, Kotzebue Sound, Arctic Alaska, during the summer of 1849 (Coues, 1884, p. 78, footnote). This was the first and, for many years, the only known example of the species in summer plumage. and from 1849 until 1915 it was the only recorded specimen from North America. Hence the position of this individual specimen has been unique, and we are able to check up discrepancies in different published accounts with the reasonable assurance that the varying statements encountered all refer to the same bird. The first record that the author has been able to find of this particular specimen is in the 'Proceedings' of the Zoological Society of London for 1859 (p. 201) where it is mentioned as having been exhibited by Mr. Sclater at a meeting of the Society. At that time, ten years after its capture, the bird was supposed to have come from the "Northeastern Coast of Asia." In 1903 this same specimen seems to have afforded the only basis for Coues' statement (p. 813) concerning the species: "breeding" "on the Arctic coast of Alaska." The history of this specimen in literature is shown on the following diagram (Fig. 1), illustrating the relation of all subsequent published statements to the original record in 1859, and also how the supposed locality of capture has shifted from Asia to North America.

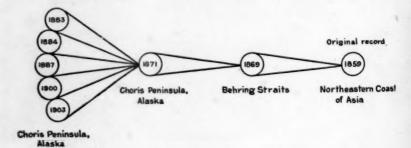


Fig. 1. Diagram of records relative to the first known "summer" specimen of Spoonbilled Sandpiper showing: (1) relation of records; (2) gradual shifting of the records of the locality of this specimen from Asia to North America.

1903. Coues, p. 813. "Breeding on the eastern Arctic coast of Siberia, and also on the Arctic coast of Alaska."

- 1900. Grinnell, p. 74. "This specimen was in summer plumage and was taken on the Choris Peninsula by Captain Moore of H. M. S. Ployer in 1849."
- 1887. Nelson, p. 112. "The presence of this remarkable little Sandpiper in the list of birds of Alaska is due to the capture of a specimen at Choris Peninsula, during the summer of 1849, by the captain of the British ship Plover Proceedings of the Zoological Society (1871, p. 110)."
- 1884. Coues, p. 78. "It is recorded by Harting, P. Z. S., 1871, pp. 111, 114, from Choris Peninsula, the specimen said to have been procured there in 1849, and figured in the Ibis, 1869, p. 426, Pl XII"
- 1883. Nelson, p. 87. "The record of this specimen is in the proceedings of the London Zoological Society for 1871, p. 110."
- 1871. Harting, p. 111. "It was obtained by Capt. Moore on the Choris Peninsula....This specimen was described and figured in 'The Ibis' for 1869, p. 426, Pl. XII."
- 1869. Harting, p. 433. "24. One in summer plumage from Behring's Straits, by expedition under Capt. Moore in H. M. S. 'Plover' (Proc. Zool. Soc. 1859, p. 201). Now in new Museum at Oxford."
- 1859. Secretary Zool. Soc. London, p. 201. "Mr. Sclater exhibited specimens of two rare species of Arctic birds from the collection of John Barrow, Esq....One of these was the new species of Diver with a white bill, described by Mr. G. R. Gray as Colymbus adamsi....The other was an example of the exceedingly scarce Wader with a spatulated bill Eurinorhynchus pygmæus...in what was apparently its summer dress, the head, neck and breast being rufous....The locality of this specimen was supposed to be the North-eastern Coast of Asia."

The following data regarding the itinerary of the *Plover* on this particular voyage have been obtained chiefly from 'The Tents of the Tuski' by Lieut. W. H. Hooper, an officer under Capt. Moore during this voyage of the *Plover*. Seeman's narrative of the voyage of H. M. S. *Herald*, 1845–51, also throws considerable light on this voyage of the *Plover*, as both ships were sent on the same mission. The *Plover* and *Herald* were two of several ships sent out between 1848 and 1852 from England to search for Sir John Franklin. The *Plover* sailed from England in January, 1848, on this voyage (Seemann, 1853, p. 191) but being a slow sailer did not reach her destination, Kotzebue Sound, that year. The *Plover* went into winter quarters in what is now known as Plover Bay, a small bay within Providence Bay, northeastern Siberia

(Hooper, 1853, p. 12). The vessel remained frozen in the ice at this point from October, 1848, until the last of June, 1849. Hooper (1853, pp. 206-207) states "we sailed from Emma's Harbor at the end of June, and proceeded up Behring's Straits, anchoring several times near the Asiatic shore, on which occasions parties of our friends visited the ship. The last point of contact was the Bay of St. Laurence." From this point "we steered for Kötzebue Sound and anchored near Chamisso Island on the 14th of July." Here Lieutenant Hooper started ashore but was called back by the arrival of the Herald, and "both ships' crews were therefore immediately set to work to transfer stores and provisions. On the 18th the 'Herald' and 'Plover' weighed at an early hour." Seemann (1853, p. 193) states that the Plover was "off Wainwright Inlet on the 25th of July, 1849." She returned from her Arctic cruise and again met the Herald at Kotzebue Sound on September 2, 1849. From Simmonds (1852, p. 308) we learn that "the Plover was safely ensconced for the winter of 1849-50 in Kotzebue Sound."

In looking over the ten species of birds, specimens of which are indicated by Harting as having been obtained on the Choris Peninsula in 1849 by Captain Moore of the *Plover* (Harting, 1871, p. 114; Grinnell, 1900, p. 66), we find that the list contains no species peculiar to North America. However, we do find that at least two of the species (Spoon-billed Sandpiper and Mongolian Plover) are essentially Asiatic. To the author's knowledge only two other American specimens of the Spoon-billed Sandpiper and no other specimen of the Mongolian Plover have been claimed to have been taken in Alaska since 1849.

The Plover and her crew wintered in 1848–49 and spent the main portion of the breeding season of 1849 along the coast of northeastern Siberia, the region which has recently been proved to be the main breeding ground of the Spoon-billed Sandpiper (Brooks, 1915, p. 382). On the other hand, only four days (July 14–18, 1849) were spent at Choris Peninsula, Kotzebue Sound, most of this time being devoted to transferring stores aboard the ships (Hooper, 1853, p. 213).¹ Under the circumstances it would seem

<sup>&</sup>lt;sup>1</sup> Mr. W. L. Sclater, Editor of 'The Ibis,' was written to in regard to the present condition of Captain Moore's specimen of Eurynorhynchus pygmæus. At his kind solicitation, both

that the first record (1859) was correct and that Captain Moore's specimen really did come, as first recorded, "from the Northeastern Coast of Asia." The present author believes this to have been the case.

Two other questionable American records of the Spoon-billed Sandpiper have been reported. Ridgway (1881, p. 85) states: "Spoon-billed Sandpiper — Point Barrow, Arctic Coast of Alaska, fide Dr. T. H. Bean." Bean (1882, p. 165), however, records a single specimen, secured by a native boy at Plover Bay, Siberia, "most probably late in August, 1880." Seebohm (1888, p. 441) states: "Nelson obtained a specimen in Alaska." This appears to have been an error, since Nelson (1887, p. 112) states that he secured a single specimen at Plover Bay, on the Siberian shore in 1881 and then adds "but not another individual of this rare bird was seen."

The only well established occurrence of the Spoon-billed Sandpiper in America is that vouched for by Fred Granville of Los Angeles, California, who on August 15, 1914, took two specimens at Wainwright Inlet, on the Arctic Coast of Alaska (referred to heretofore only casually, by Swarth, 1915, p. 136). One of these specimens, a female, is now number 3552 in the collection of A. B. Howell, of Covina, California, while the other, a male, is number 1698 in the collection of G. Willett of Los Angeles. Through the courtesy of these gentlemen, the writer has been enabled to examine the Granville specimens and to compare them with a male bird taken at Cape Serdze, Siberia (no. 16699, Mus. Vert. Zool.), and another male taken by Granville, July 12, 1914, at Russian Spit, Siberia (no. 3551, Howell coll.). Both of the Wainwright specimens, although taken the middle of August, are still in the summer plumage, with the chestnut edgings of the feathers on the upper parts, and the chestnut wash on the head and throat almost as

the bird and the museum records concerning it have been examined by Mr. Henry Balfour, curator of the Pitt Rivers Anthropological Museum at Oxford, England. The specimen is still (February, 1918) mounted and in a good state of preservation at the Oxford Museum, having been kept under a small bell-glass and away from strong light. No additional information regarding the locality of capture of this specimen was, however, forthcoming. The entry in the Catalogue of the Comparative Anatomy Department of the University Museum at Oxford is as follows: "In summer plumage, obtained in Behring Strait by Capt. Moore, 1849"; while according to the label on the stand on which the specimen is mounted, "This specimen was taken in Behring Straits."

bright as in breeding birds. The writer has been unable to discover any indication of the fall molt in these two specimens.

Mr. Granville has given me a full account of the circumstances under which he took these two Spoonbills at Wainwright Inlet. The following extracts, slightly modified in wording, are from his letter of January 9, 1918. "On August 15, 1914, I and my assistant hiked back of Wainwright to what I judged to be a distance of about ten miles, traveling in a northerly direction.... The tundra where I found the Spoonbills was interlaced as far as the eye could see with little lagoons and long channels of water, and in this territory I collected the two Spoon-bills.... These birds were shot out of a flock of possibly ten. I followed them for about an hour before I could get a shot at them. The birds would run along the tundra en masse and were undoubtedly gleaning food from the The minute they would catch sight of me they would fly out of shot-gun range. There were about six birds that looked to me through field glasses to be in markedly different plumage from the birds I shot. These six birds, immature as I supposed, seemed to be of a solid color and that a dark gray. On the first shot fired, with which I got two, the birds flew across a lake and I lost track of them, though I spent four or five hours looking for some more.... I believe that these birds breed in the neighborhood of Wainwright and hope that at some close future date someone will bear out my statement"

It is a common occurrence for whaling and exploring vessels to visit both the Siberian and American shores during a summer cruise in the Arctic, hence reliability of the collector is the only guarantee as to places of capture of specimens gathered on such a cruise. Since the species under discussion is rare on the American shore and occurs in relatively much greater abundance on its breeding ground on the Siberian side, it is one regarding which mistakes might easily occur. Mr. Granville, while not a well-known collector, has been a member of the Cooper Club for several years, and is a man whose observations we can accept without question.

The writer spent several days at Wainwright Inlet two weeks after Mr. Granville's departure and although the various flocks of sandpipers present, then mostly in winter plumage, were examined with binoculars, no Spoon-bills could be found. The fall migration was much in evidence at this time. Whether Granville's birds were some that had bred at Wainwright, as he supposed, or were merely stragglers from Siberia after the breeding season, is uncertain. The true status of the species at this point can only be settled by further field work at Wainwright Inlet during the breeding season.



Fig. 2. Map showing summer record stations of Spoon-billed Sandpiper.

From our present data, the range of the Spoon-billed Sandpiper may be defined as follows: The breeding habitat lies along the Arctic coast of northeast Siberia, possibly also at favorable localities on the Alaskan coast (see Fig. 2), spring and fall migration route along the Asiatic shores of Bering Sea and the Pacific Ocean, and winter home in southern India. The following record of specimens from the 'Catalogue of Birds in the British Museum' (Sharpe, 1896, p. 537) affords an outline of the migration route of this bird. An adult male, still in summer plumage, was taken August 8, at the mouth of the Amur River in southwestern Russia. An immature

was secured on October 8 at Hokodadi [Hakodate], Japan, while an adult female was collected at Ragoon, India, on December 1. The spring migration is represented by an adult male in summer plumage taken in April at Shanghai, China.

Although this bird has been known for many years, at least as far back as the time of Linnæus in 1764 (Harting, 1869, p. 428), it was only the winter plumage with which ornithologists were familiar. The summer dress was unknown until 1849, when Captain Moore of the Plover took his single specimen. The breeding ground of this species was not definitely known until Johan Koren found young Spoon-billed Sandpipers able to run on July 24, 1909, on the mainland near Koliuchin Island, northeast Siberia. Koren also took a half-fledged young on July 28 or 29, 1909, at Cape Wankarem about seventy miles west of Koliuchin Island (Koren, 1910, pp. 14-15). To John E. Thayer, we are indebted for the first published description of the nest and eggs of this rare wader, based upon a nest with four eggs and the male parent, together with eight downy young, secured by Captain F. E. Kleinschmidt at Cape Serdze, northeast Siberia, July 15, 1910. This article, published in 'The Auk' for April, 1911, was illustrated by colored plates of the eggs and the head and bill of the downy young and adult stages.

Nordenskiöld (1881, p. 43) reports that birds of this species appeared in numbers in June near the winter quarters of the Vega. This locality was near the east shore of Koliuchin Bay. Nordenskiöld, however, discovered no evidence of the species breeding at this point and it was nearly thirty years later that Koren found young Spoon-billed Sandpipers in this region.

The present author met his first living Spoon-billed Sandpiper at Providence Bay, Siberia (see Plate V, Fig. 1) the middle of June, 1913, when upon an ornithological cruise in the Arctic in the interests of John E. Thayer, who has kindly permitted the use of such notes and material as were needed in the preparation of this article.

In color, size and actions the Spoon-billed Sandpiper closely resembles the Eastern Least Stint (*Pisobia minuta ruficollis*), the marked similarity between them resulting in both the author and his fellow collector W. S. Brooks, failing to distinguish between the

two species until June 20, after we had been among them for some days. However, despite our initial failure to secure the birds, it is my belief that the Spoon-bill begins to arrive on its breeding grounds by the end of the first week in June. A pair of sandpipers was encountered near the east shore of Emma Harbor, in Providence Bay, on June 6, 1913, which evidently belonged to this species. The male was at this time energetically engaged in his characteristic nuptial song flight while the female fed quietly among the tussocks near the edge of a pond on the tundra.

Although the spatulate tip of this bird's bill is very noticeable when viewed from directly above or below, it is not a character which can be advantageously used to identify the species in the field, for the simple reason that in nearly all close views of the living bird only lateral or frontal aspects of the bill are obtained. Viewed from the side, as shown in Thayer's illustration (loc. cit., Plate II, Fig. 5), the bill is not sufficiently peculiar in outline to be distinguished from those of other small sandpipers at any great distance. Even when a bird was feeding, and the bill was observed under the most favorable conditions, the peculiar shape was not nearly as conspicuous as one would expect. In the author's experience, the most reliable method of identifying the bird in the field was by noting the glint of light that was reflected from the broad tip of the upper mandible when the sunlight struck the bill at a certain angle. Even in flight, the bird could often be identified by this faint beam of reflected light. Our first specimen was collected on June 20, suspicion having been directed to this particular bird by seeing the sunlight reflected from the tip of the bill, as above described.

We found that the Sandpiper had a decided preference for the grassy margins of fresh-water ponds, while single birds were frequently found feeding along the algæ-bordered rims of tundra pools. Sandy lagoons where rivers entered the bay were favored by them as well.

The song and nuptial flight of the male Spoon-bill, attractive as they were to the collector, in sight of such rare birds at last, were as elusive as a will-o'-the-wisp. In fact we were never able to locate a female Spoon-bill on the nest and I have always believed that our lack of success in this regard was due to the warning given

by the male. Upon approaching the nest site, while we were yet afar off, we were greeted by the male in full song. This song, ventriloquial, pulsating, and cicada-like in quality, seemed to come first from one and then from another point in the heaven above. Sometimes we searched the sky altogether in vain, but usually the bird was discovered in rapid flight at an altitude of two or three hundred feet above the earth.

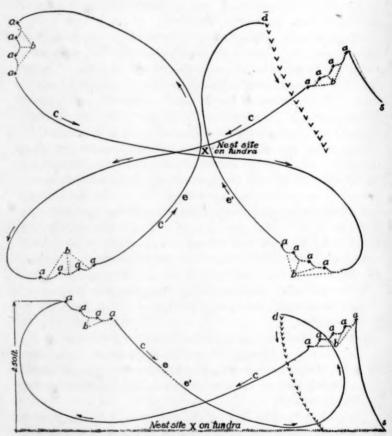


Fig. 3. Diagrams of the nuptial flight of the Spoon-billed Sandpiper. Upper figure represents the flight as viewed from above. Lower figure depicts one half of the same evolution as seen from one side. (s) start, (a) Poise or hover accompanied by song, (b) short dip (no song), (e) rapid sweep down over nest site, ending in new position, (d) gentle glide to earth, ( $\times$ ) nest site on tundra. Flight e to e' in upper figure is represented by the broken line e to e' in the lower figure.

The nuptial flight consists of momentary poises alternating with rapid dips (Fig. 3). When the bird hovers or poises, the rapid beating of the wings is accompanied by a fine, rhythmical, pulsating, buzzing trill: zeé-e-e, zeé-e-e, zeé-e-e, rapidly repeated (Fig. 3a). Following this the bird approaches the intruder, swinging down in a sharp curve until ten feet lower than the previous hovering point (Fig. 3b) where he again poises on rapidly beating wings, pouring forth anew his insistent, musical trill. After repeating this performance four or five times, the songster sweeps down in a long graceful curve (Fig. 3c) until he almost touches the earth near his brooding mate, then curving off, he turns and rises rapidly and almost perpendicularly until almost out of sight. From this new point of vantage the whole performance is repeated. After four or five such excursions, in each of which the intruder is approached from a different direction, the guardian of the nest descends by raising his wings nearly vertically until they form in anterior outline the letter V. The bird thus gliding on motionless wings drops lightly but quickly to earth, uttering the zeé-e-e in a richer yet more subdued tone (Fig. 3d). As soon as he touches the earth the song ceases and the silent bird trots quietly off over the moss, where his trim form blends with the lichen and mossy tussocks so that, upon remaining motionless he disappears with amazing rapidity. Time and again we thus lost sight of the birds, which we later discovered by the aid of binoculars, to be standing or squatting motionless within fifty feet of us. Although this "fading out" method of exit is commonly employed by many shore birds, in the case of the Spoon-billed Sandpiper it seems to have been developed to an extreme degree.

The two nests of this bird that came under the author's observation were discovered through flushing the brooding male. The birds were very shy and as there was no cover other than a thin growth of grass about six inches high, approach by stealth was difficult (see Plate V, Fig. 2). The birds usually sneaked off while the observer was forty or fifty yards distant, and in order to find the nest it was necessary to hide, as best one could, near the place where the sandpiper had flushed, until it returned again to the nest. In one instance a depression partly filled with water was the only available hiding place. Fortunately for the watcher the water

was not cold and the male bird returned in twelve minutes to the nest, which contained two fresh eggs (Plate V, Fig. 2).

The most striking fact in the domestic life of the Spoon-billed Sandpiper is that the major portion of the household duties, aside from the actual laying of the eggs, is performed by the male and not the female bird. In addition to our own observations Klein-schmidt also has found this to be the case. He states: "Although our observations were limited to but a few, still I believe the male solely attends to the hatching and rearing of the young." (Thayer, 1911, p. 154). In the author's experience, none of the several females taken were found on or within fifty feet of the nest. It is possible, however, that they may have been warned by the male birds and had sneaked off before we were close enough to detect their leaving.

In the unequal division of domestic duties conditions among the Spoon-bills are similar to those among the Phalaropes where the male, after he has been courted and won by the larger and more brilliant female, takes upon himself almost all of the household cares. However, in the case of the Spoon-billed Sandpiper there is nothing to show that the female does the courting although she is the larger of the two. Mr. Thayer in commenting on the relative size of the sexes states: "In looking over my series of fourteen skins, all adults, I find that the females are larger and their mandibles noticeably so" (Thayer, 1911, p. 154). The female Spoonbill is thus seemingly content to merely lay the eggs, while she lets. the male build the nest, incubate the eggs, and take care of the young. In corroboration of the latter statements the author observed a male bird building a nest at Providence Bay, Siberia, June 22, 1913, another male was flushed repeatedly from a nest containing two fresh eggs near the same place on the same day, while a third male was found tending three downy young at Cape Serdze, Siberia, on July 17, 1913.

The nest of this Sandpiper was found to be merely a cavity scratched out among the dead grass blades. It was a shallow affair placed where the grass grew thickest (Plate V, Fig. 2). On June 22, 1913, at Providence Bay, the writer witnessed the construction of a nest from a distance of about forty feet. The bird, a male, scratched and then picked at the dead and matted grass

blades and moss until he had dug out quite a hole. Then he squatted down in the depression and twisted about, pressing against the moss that formed the sides of the nest, until a cavity about three and one-half inches in diameter and an inch deep was formed. Dead leaves from a creeping Arctic willow that grew in the moss nearby, were used to line the nest.

We have the following data regarding the dates at which the eggs are laid and the number of eggs in a set. A clue is also afforded as to the time required for the eggs to hatch.

Locality	Date	Nesting evidence	Collector
Providence Bay, Siberia	June 22, 1913	2 fresh eggs in nest	J. Dixon
Providence Bay, Siberia	June 22, 1913	Nest in course of construc- tion	J. Dixon
Cape Serdze, Siberia	July 15, 1910	4 eggs "just ready to hatch"	F. E. Kleinschmidt
Cape Serdze, Siberia	July 17, 1913	3 young just out of nest	J. Dixon

From the above data it seems probable that the set is of three or four eggs; June 20 to 25 may be taken as the time when laying begins. The eggs of the Spoon-bill found by the author at Providence Bay were not markedly different in markings, shape or color from those of other small sandpipers, such as the Eastern Least Stint. In the field, the eggs of the Spoon-billed Sandpiper appeared to be slightly larger than those of the Stint. The measurements of the four eggs collected by Kleinschmidt are given by Thayer (1911, p. 154) as follows: " $1.20 \times .92$ ;  $1.22 \times .90$ ;  $1.20 \times .88$ ;  $1.30 \times .90$  inches." For positive identification, we found it advisable to secure the parent bird with the eggs, and in order that there might be no mistake, the incubating male was secured just as he jumped from the nest.

Regarding the time required for incubation, we have only circumstantial evidence to offer (see preceding table), but our observations lead us to believe that about eighteen or twenty days elapse between the time the last egg is laid and the first young hatched.

On July 17, 1913, at Cape Serdze, Siberia, while strolling along the spongy green turf beside a fresh-water pond, my attention was attracted by the "broken wing" antics of a Spoon-billed Sandpiper. Although my eyes remained "glued" on the spot from which the bird arose, no nest or sign of young could be found when I reached the place. Soon a second bird, presumably the female. arrived on the scene. Both appeared much concerned and from their actions I felt sure that there were young near by. A careful search of the short grass, which was not over two inches high, failed to reveal any living creature. I therefore retired to a grassy mound about twenty yards away and awaited developments. Both parent birds, giving their alarm notes, circled about overhead, where they were soon joined by a pair each of Eastern Least and Temminek's Stints. The two pairs of stints were later found to have broods of downy young in the grass on the opposite shore of the lagoon near by. Soon both Spoon-bills flew off across the lagoon and disappeared, but the male returned promptly, alighting quietly near the margin of the pond. Here he stood motionless for nearly a minute, and then trotted through the grass directly to the spot from which I had first flushed him. At this point he stood still for another full minute, during which time he looked all around, seemingly to make sure that the coast was clear. Having satisfied himself that no active enemy was in sight he stepped forward and bending over uttered a soft call in a low tone "plee-plee-plee." This call was repeated a second time, and instantly there arose directly in front of him a tiny mouse-like brown form, seemingly rising from out of the very ground. With tottering unsteady steps the downy young sandpiper stumbled and fell toward the parent, who continued calling and encouraging it.

Upon my sudden appearance, the old bird gave a quick warning note and at this signal the youngster squatted motionless with neck stretched forward on the ground. Although I knew the exact spot where it disappeared, it was some time before I was able to locate the tiny form, so well did it blend with the clump of reddish moss upon which it had squatted. A careful search revealed no other young sandpipers so I returned to my hiding place. This time I had to wait longer for the male to return and, while I was waiting, a second sandpiper which I believed to be the female arrived but did not go near or call the young.

Two or three minutes elapsed this time between the return of the male and the giving of the low call notes, when as before another downy young quickly arose at the signal and toddled over to its parent. After this second experience I was forced to change my hiding place, as the male Sandpiper refused to return to the young until I moved. He seemed much concerned upon this last visit, probably realizing that it was high time the young should be hovered and warmed.

I could not understand why all the young had not risen at once in answer to the parent's call but I noticed that he had in each case gone up to within less than two feet of the one in hiding, and then with lowered head facing the chick, gave the call note. In each case it was the youngster thus directly addressed that responded to the signal and arose. The note of the young was a low rusty squeak, scarcely audible to human ears. It was very similar to the note of the young Semipalmated Sandpiper (see Dixon, 1917, p. 190).

As far as my observations went, there was no attempt on the part of the parent to feed the young, and it is my belief that from the time they are hatched the young Spoon-bills hunt their own food. The exercise thus gained was found in the case of young Semipalmated Sandpipers to be essential to the health of the chicks. In addition to keeping warm by running about the young Spoon-bills are hovered and warmed at regular intervals by the parent. The brood mentioned above had survived a fairly severe snowstorm on the preceding day.

An effort was made to carry the three downy Spoon-bills back to the ship alive, and as we had "hopped, skipped and jumped" ashore over a mile of drifting ice cakes, the packing was done with care. A thick nest of cotton was made in the collecting basket, but within an hour the young sandpipers began to go into convulsions and although they were placed inside of the author's "parka" next to his body, they all soon died. Their death seemed to be due to lack of exercise, as they were kept warm, and certainly could not have starved to death in an hour. Manniche (1910, p. 146) reports a similar experience with two downy young of the Sanderling, on the breeding grounds of this species in northeast Greenland.

As has been pointed out by Thayer (1911, p. 154), the bill of the newly hatched young of this Sandpiper shows the characteristic "spoon" well developed. The narrow part of the bill of a downy young Spoon-bill is short compared with that of the adult, while

the spatulate tip is more oval, as compared with the angular outline of the bill of the adult bird. In outline the bill of the young closely resembles the conventional "spade" on playing cards.

Our observations disclosed no peculiar advantage attending the singular shape of this sandpiper's bill, though careful watch was kept to see just how this member was used. On July 17, 1913, a pair of Spoon-billed Sandpipers was watched for half an hour as the two birds fed within fifty feet of the observer, concealed behind a sandy dune. Their favorite feeding ground was a fresh-water pond with a fringe of green algæ about the sandy border. Under these conditions the birds used their bills as any other sandpipers would, as probes to pick out insects or larvæ from the algæ. Occasionally one would hesitate a moment, when the vascular tip of the mandible quivered slightly as though the bird were straining something out of the green algæ. At this time the bill was held at nearly right angles to the surface of the water; it was never used as a scoop along the surface.

The width of the tip of the bill varies greatly in freshly killed specimens, regardless of sex, as shown at time of capture among the twelve specimens we secured. Of two males at hand, one (Mus. Vert. Zool. no. 16699) has a bill with a width of 11.6 mm., while the other (Willett coll., no. 1698) measures only 9.4 mm. in width.

Comparatively little seems to be known regarding the development and molt of the young of this species. Koren found young able to run about on July 24, 1909, on the mainland near Koliuchin Island. On July 29 at Cape Wankarem he found young "half fledged" and got one of these on the wing at fifty yards. Granville, as previously detailed, saw what he thought were six immature birds of this species in the gray or winter plumage at Wainwright Inlet, Alaska, on August 15, 1914. In spite of the considerable accumulation, during recent years, of data relative to the nesting habits of this peculiar spoon-billed wader, there are many important facts in the life history of this species yet to be ascertained.

#### LITERATURE CITED.

- BEAN, T. H.
  - 1882. Notes on birds collected during the summer of 1880 in Alaska and Siberia. Proc. U. S. Nat. Mus., 5, pp. 144-173.
- BROOKS, W. S.
  - Notes on birds from east Siberia and Arctic Alaska. Bull. Mus. Comp. Zool., 59, pp. 361-413.
- Cours, E.
  - 1884. [Review of] Nelson's Birds of Bering Sea and the Arctic Ocean.
    Auk, 1, pp. 76-81.
  - 1903. Key to North American birds. (Boston, Page), 5th ed., 2, pp. vi + 1152, profusely illustrated.
- DIXON, J.
  - 1917. Children of the midnight sun. Bird Lore, 19, pp. 185-192, 10 figs. in text.
- GRINNELL, J.
  - Birds of the Kotzebue Sound region. Pacific Coast Avifauna,
     pp. 1-80, 1 map.
- HARTING, J. E.
  - 1869. On rare or little-known Limicolæ. Ibis, 5, pp. 426-434, 1 pl. and 1 fig. in text.
  - 1871. Catalogue of an Arctic collection of birds presented by Mr. John Barrow, F. R. S., to the University Museum at Oxford; with notes on the species. Proc. Zool. Soc. London, 1871, pp. 110–123, 2 figs. in text.
- HOOPER, W. H.
  - 1853. Ten months among the tents of the Tuski. (London, Murray), pp. xv + 417, 1 pl., 10 figs. in text, 1 map.
- KOREN, J.
  - 1910. Collecting on Tchonkotsk Peninsula. The Warbler, 6, pp. 2– 15, 19 figs. in text.
- MANNICHE, A. L. V.
  - 1910. The terrestrial mammals and birds of north-east Greenland. Danmark-Ekspeditionen Til Grønlands Nordostkyst 1906–1908, København, Bianco Lunos Bogtrykkeri, Bind. V. Nr. 1, pp. 1–199, pls. I–VII, 43 figs. in text., 1 map.
- NELSON, E. W.
  - 1883. Birds of Bering Sea and Arctic Ocean. Cruise of Revenue Steamer Corwin in Alaska and the north west Arctic Ocean in 1881 (Washington, Govt. Printing office), pp. 55–118, 4 pls.
  - 1887. Report upon natural history collections made in Alaska between the years 1877 and 1881. Arctic Series of Publications issued in connection with the Signal Service, U. S. Army, 3, 337 pp., 21 pls.

NORDENSKIÖLD, A. E.

1881. The voyage of the Vega round Asia and Europe. (London, Macmillan Co.), 2, pp. xvii + 464, with 5 steel portraits, numerous maps and illustrations.

RIDGWAY, R.

 Nomenclature of North American birds chiefly contained in the U. S. National Museum. Bull. U. S. Nat. Mus., 21, pp. 1-94.

**SEEBOHM**, H.

1888. The geographical distribution of the family Charadriidæ or the plovers, sandpipers, snipes and their allies. (London, Sotheran), pp. xxiv + 524, 21 pls., many unnumbered figs. in text.

SEEMANN, B.

1853. Narrative of the voyage of H. M. S. Herald 1845–51. (London, Reeves), 2, pp. vii + 302, 1 pl.

SHARPE, R. B.

1896. Catalogue of the Limicolæ in the collection of the British Museum. 24, pp. xii + 794, 6 pls., many figs. in text.

SIMMONDS, P. L.

1852. Sir John Franklin and the Arctic regions. (Buffalo, Derby), pp. xvii + 396, many illustrations, 1 map.

SWARTH, H. S.

 Minutes of meeting of Cooper Ornithological Club. Condor, 17, p. 136.

SECRETARY ZOOL. Soc. LONDON.

1859. [Report of Meeting of May 10, 1859.] Proc. Zool. Soc. London, 1859, p. 201.

THAYER, J. E.

Eggs of the Spoon-bill Sandpiper (Eurynorhynchus pygmæus),
 Auk, 28, pp. 153–155, 2 pls.

### A WINTER CROW ROOST.1

BY CHARLES W. TOWNSEND, M.D.

PRIOR to the winter of 1916-17 most of the Crows of the eastern parts of Essex County, Massachusetts, spent the nights in roosts in the pine thickets at Annisquam and West Gloucester. Hither from all directions in winter afternoons these birds could be seen wending their way. The general course of flight over the Ipswich dunes was from north to south. There were, however, several small roosts in the Ipswich region. One was in a grove of white pines and cedars on the south side of Heartbreak Hill; another, which lodged about five hundred birds, was in one of the pitch pine thickets of the Ipswich dunes. In November, 1916, I discovered that the ground under and near the large thickets of evergreens and hard woods on the southerly side of Castle Hill close to Ipswich beach was covered thickly with Crow pellets and droppings. I was not surprised, therefore, to find that the afternoon flight of Crows was directed towards these thickets, and that the birds were passing over the dunes in an opposite direction to that taken in former years. Whether the great roosts at Annisquam and West Gloucester have been deserted or not I cannot say, but it is evident that the larger number of birds have transferred their winter nights' lodgings to Castle Hill.

Twenty-five years ago the whole southerly side of Castle and High Hills was pasture and mowing land. The owner at that time began planting trees on a large scale. At first only visible in the grass these have grown to a height of thirty or forty feet, and there is now a respectable forest over twenty or thirty acres of land. The evergreen trees are largely European species—Scotch and Austrian pines with spruces and firs. There is a large grove of European larches, and there are patches of willows, maples, ashes, buttonwoods and other deciduous trees.

In the short winter afternoons the Crows begin their flight to the roost long before sunset. By three o'clock or even as early as one o'clock, especially in dark weather and in the short December days, this bed-time journey begins, while in the latter part of

<sup>&</sup>lt;sup>1</sup> Read before the Essex County Ornithological Club, December 10, 1917.

February the flight is postponed until half past four or a quarter of five. From every direction but the seaward side the Crows direct their course towards the roost. Three main streams of flight can be distinguished: one from the north, from the region of the Ipswich and Rowley "hundreds,"—the great stretches of salt marsh that extend to the Merrimac River,—a second from the west and a third,—apparently the largest of all, broad and deep and highly concentrated,—from the south.

It was the last of these rivers that on a cold December afternoon with a biting wind from the northwest I first studied in company with Mr. Francis H. Allen. It was an impressive sight. About 3 o'clock the Crows began to appear, singly and in small groups, beating their way in the teeth of the wind towards the north. In flying over the estuary of the Castle Neck River they kept close to the water as if to take advantage of the lee behind the waves; over the land they clung to the contour of the dunes. As we walked among these waves of sand the Crows often appeared suddenly and unexpectedly over the crest of a dune within a few feet of us. Silently for the most part, except for the silken rustle of their wings, they flew over in increasing numbers until it was evident that they were to be counted, not by hundreds, but by thousands. Many of them alighted on the dunes to the south of the roosting place; sand, bushes and stunted bare trees were alike black with them. Others assembled on the bare hillside to the east. About sunset a great tumult of corvine voices issued from the multitude, - a loud cawing with occasional wailing notes, and a black cloud rose into the air and settled in the branches of the bare trees to the west of the roost. From here as it was growing dusk they glided into the evergreens for the night.

The last day of the year 1916, I spent with Dr. W. M. Tyler in the dunes. The wind was fresh from the northwest,— the temperature was 15° Far. at 6.30 A. M., 18° at noon and 20° at 6 P. M. As early as one o'clock in the afternoon a few Crows were seen struggling north over and close to the surface of the dunes. Others were noticed flying high and towards the south. This southerly flight came from over Castle Hill to the north, passed the roost and continued on over the dunes. At half-past three some of these birds, which were apparently turning their backs on their usual

night's lodging place, met with a large company coming from the south and all settled together in the dunes about two miles south of the roost. Some of the birds coming from the north, however, settled on the bare fields by the roost, and their numbers here were augmented by a stream from the west. This concourse on the hillside set up a great tumult of cawings just before four o'clock. At five minutes after four the united multitude of northerners and southerners rose from their meeting place in the dunes and flew low to join their noisy brethren on the hillside. This river of black wings from the south was a continuous one and it was joined just before its debouch on the hillside by the stream from the west. The river from the north had split into two layers: the lower flying birds came to rest on the hill,—the higher flying ones favored by the strong northwest wind, continued on their way south, notwithstanding the great current that was sweeping north below them. They joined their comrades in the dunes and retraced their steps. No signs of starvation and impaired vigor in these unnecessary flights, or in the games of tag in which two or more of the birds would at times indulge!

The pace is now fast and furious. The birds are anxious to get within touch of the roost before it is dark but none have yet entered it. At 4.15 P. M., 135 birds pass in a minute from the south alone on their way to join the concourse on the hillside. A little later this southern river becomes so choked with birds that it is impossible to count them. From our point of vantage in a spruce thicket on the hill we can see that this flock stretches for two miles into the dunes and it takes four minutes to pass. The speed of flight, therefore, must be roughly about thirty miles an hour. At 4.15 P. M. the sun sets, but in the yellow glow of the cloudless sky the birds can be seen pouring by from the west and south. The bulk of the stream from the north now comes to rest on the hillside for only occasionally can a crow be seen flying to the south over the heads of the southern stream.

At 4.35 P. M. Dr. Tyler and I again counted the southern stream for a minute as they flew silently between us and the lighthouse. One of us counted 160 the other 157 birds, so it is probable that our counts were fairly accurate. This constant watching of the black stream from the south against the white light-house pro-

duced in both of us a curious optical illusion. The light-house and dunes seemed to be moving smoothly and swiftly from north to south!

At 4.37 P. M. a great cawing arose from the hillside and a black cloud of birds rose up, some to enter the roost, others to subside on the hillside. It was evident that the birds from time to time had been diving into the roost. At 4.40 P. M. it was rapidly growing dark and the tributary streams were evidently dwindling. Only 50 went by the light-house in a minute. Five minutes later it was nearly dark and only a few belated stragglers were hurrying to the concourse on the hill.

At 4.45 P. M. Dr. Tyler and I walked around to the north of roost and although we could see nothing in the darkness we could hear the silken rustle of wings and feathers as the Crows were composing themselves for the night's rest among the branches of the trees. The babble of low conversational notes that went up from the company suggested the sounds of a Night Heronry although cawings and carrings were interspersed with the kis and uks and ahhs. The odor was that of a hen-yard. The temperature in the grove, with its hundreds of corvine furnaces breathing out air heated to 105° or thereabouts, was probably distinctly higher than in the open. We refrained from entering the thicket, for any attempt to do so aroused the birds to flight.

In the dim light we could make out that the hillside field between the roost and the sea was still blackened with birds that were continually rising up and entering the trees. Some of them perched temporarily on the bare tops of the hard woods where they were visible against the sky. The noise and confusion were great. It would seem as if the roost was so crowded that the birds had to wait their time for a chance to get in and that a constant shifting of places and crowding was necessary before the Crows could settle in peace for the night. Hence the prolonged and varied conversation; hence the profanity.

It was an intensely interesting experience, this observation of the return of the Crows to their night's lodgings, and one wished for eyes all about the head, well sharpened wits to interpret and a trained assistant to take down notes. How many birds spent the night in the roost? That is a difficult question to answer, but a rough estimate can be made. There were three streams entering the roost beginning at one o'clock and continuing until a quarter of five. The largest of these was from the south, the next largest from the west and the smallest from the north. The greatest flight occurred in the hour before dark. From counts made in the stream from the south this flow averaged at least a hundred in a minute or 6,000 in the hour. If we suppose that an equal number arrived in the combined western and northern streams there would be 12,000 occupants in the roost, a very moderate estimate, I believe.

Crows were not the only species that sought refuge for the night in these evergreens. At half-past four a Starling was seen flying thither. But the great flight of Starlings appeared shortly after four. There were about two hundred of them - a mere nothing compared with the enormous multitudes that are soon destined to inhabit these regions, for the European Starling, introduced in some evil moment to these new lands of the western Hemisphere, is increasing by leaps and bounds. This flock of two hundred Starlings flew by with a whistling of wings straight for the roost, but on its arrival at once began a series of aerial evolutions which lasted for half an hour by the watch, before the flock finally entered the roost for the night. At times the birds would spread out like a mist on the hillsides at times they would combine to form a compact dark ball; again they would stream off like a whisp of smoke, and turn and twist and snap the whip in a most amazing manner. The exhibition of this troop of Starlings was that of well trained performers executing difficult and intricate evolutions without hesitation and without fault. The rhythm and harmony of all their movements was perfect; the speed of action was so great that it was at times difficult to follow them with the eye. They opened or closed their ranks, they deployed to the right or to the left, they descended or ascended as if impelled by a common mind or as if possessed of perfect telepathic intercommunication. One could hear no word of command and there appeared to be no leader. The spirit of play was in it all and the joy of untiring energy, of perfect mastery of the air and of consummate grace and skill. It was a marvelous and mysterious exhibition.

I have often watched from my house the western stream of

Crows go by bound for the roost. With a strong northwest wind the greater number fly in the lea of the hill close to the marsh. A smaller number push their way in the valley to the north partly sheltered from the wind by the trees. It is rare that one exposes himself to the full sweep of the wind over the top of the hill. When the wind is in the east the Crows fly close to the marsh and follow the windings of Castle Creek. With a westerly breeze, however, the birds fly high and, silhouetted against the sunset glow, the birds pass over the hill at great speed, alternately flapping and sailing. Those that fly over the marshes keep at the level of the top of the hill instead of skimming close to the ground as they do in unfavorable winds. I have counted eighty and at times as many as one hundred and twenty passing in a minute in this western tributary to the roost.

The afternoon of the twenty-second of February, 1917, was cold and clear with a wind from the northwest. I made my way to the top of Castle Hill in order to watch the stream of Crows from the north. The first arrivals came at half past four o'clock. They were flying over the ice-filled marshes of the Ipswich and Plum Island Rivers, on the lookout perhaps for a last scanty portion of food before bedtime. On reaching Castle Hill they flew up over its crest and glided down into the hard woods to the east and west of the evergreen roost. Here they took part in the regular noisy evening crow reception of the three streams before retiring for the night.

At the full of the moon on the sixth of January I visited the roost at 9 P. M., a time when all well regulated crows should, I had supposed, be sound asleep. As I approached the roost much to my surprise I heard distant sleepy cries like those of young herons, and when I reached the edge of the roosting trees there was a tumultuous rush and bustle of Crows flying from tree to tree and overhead. Strain my eyes as I would only occasionally could I catch sight of a black form, although the air was brilliant with the moonlight and the reflection from the snow. I turned back at once as I had no desire to disturb the birds' slumbers but it was evident that many, even at this late hour, had not settled down for the night.

The morning flight from the roost takes less time than the evening return. As I approached it in the semi-darkness at 6.25 A. M. on

January 7, a distant cawing could be heard and a minute later nine Crows were seen flying off to the south, and three minutes later, nine went off to the west. At half past six, after a great uproar of caws and uks, occasional rattles and wailing ahhhs, a broad stream boiled up from the roosting trees and spread off towards the west, obscurely seen in the dim light except when the birds stood out against the beginning red glow in the east or against the light of the setting moon in the west. As I stood concealed on the hillside among a grove of spruces, the Crows passed over my head, noiselessly except for the silken swish of their wings, fully a thousand strong. Then no more for over five minutes although the tumult in the roost continued in increasing volume. At 6.40 the roost boiled over again, but the birds spreading in all directions soon united into a black river that flowed over the dunes to the south. The settings for this black stream were the white sand dunes and the luminous glow in the east which had become a brilliant crimson fading to orange and yellow and cut by a broad band of pink haze that streamed up to the zenith. The morning star glowed brightly until almost broad daylight. The sun rose at 7.14. At 7 I entered the roost and hurried away the few hundred remaining birds some of whom were in the bare tops of the hardwoods ready to depart, while others were still dozing in the evergreens below. The air was close and smelt like a hen house. Pellets and droppings were everywhere.

On the last day of 1916, Dr. Tyler and I watched the crows leaving the roost. We arrived at 6.40, too late to see the first departures. From time to time we counted the birds going by in the stream to the south and as our counts showed a remarkable agreement they may be taken as substantially accurate. At 6.45, 105 passed in a minute; at 6.50, 125 passed at 6.55, 58 passed, at 6.58, 121 passed and at 7.00, 63 passed.

The Starlings left the roost at 7 o'clock and passed us with a chorus of shrill cries or perhaps it was the swish of their wings that we heard. They were intent on the day's hunt for food and did not waste time on setting-up evolutions. At 7.13 the sun rose and the roost was silent and deserted.

In the early part of the winter there is plenty of food for the Crows. The bayberry and staghorn sumac bushes, the poison ivy, cat briers and red cedars are laden with their fruit. The salt marshes and beaches furnish a bountiful supply of food in the form of molluses and crustaceans as well as in dead fish and other carrion brought up by the tides. In fact it is these marshes and beaches that make such a great concourse of crows possible; — the inland country is able to support but a mere fraction of such a multitude. If the winter is a prolonged and severe one, the food problem becomes more and more difficult. All the bayberry bushes that are not covered with snow are stripped of their berries; the red flames of the sumac are battered and reduced to a spindling central stalk with but a few red furry seeds remaining. The upper beach, the source of so much food supply in dead fish, crabs and molluses, is encased in ice and built up into a wall; the marshes with their wealth of small snails and mussels is sealed several feet deep in tumbled cakes of ice, and the tide rises and falls in the creeks and larger estuaries under an unbroken icy mantle. All the uplands are buried in snow. It is difficult to conceive how this multitude of red-blooded active birds can glean enough food under these conditions. The number of food calories needed by each Crow must be large. But the Crow like the Indian and all creatures of nature is well able to take care of himself and to utilize every possible source of food supply. Neither a feast nor a famine disturbs his equanimity unless the latter is too prolonged.

Although most of the birds appeared to be endowed with plenty of strength and energy, one at least on February 22 seemed to be suffering from the hard times. This Crow alighted in a feeble tottering manner on a post within forty yards of me, and balanced himself with difficulty. I walked to within thirty yards of him when he wearily took wing only to alight in a similar way on another post a couple of hundred yards away. When flushed from this he managed to fly a few rods to the roosting grove.

Two other Crows previous to this incident were found dead near the roost. Both were normal in size as shown by measurements, and neither showed any signs of injury. One was very thin. The case of the other is worth recording in detail. It was on

<sup>&</sup>lt;sup>1</sup> In 'The Birds of Essex County,' p. 243, I recorded the examination of a Crow found dead early in March, 1904. "The body was greatly emaciated, the intestines nearly empty, and the stomach contained only a husk of outs and a piece of coal ashes. There was no evidence of disease. The bird weighed only ten ounces and was small in every way,— a case of the small and unfit perishing."

January first, 1917, that I discovered a Crow in the topmost branch of a slender fifty-foot ash tree on the edge of the roost. A string had in some way become entangled about one foot and the branch of the tree. Struggle as he would he could not free himself and although he could perch at ease on the branch, he often hung head downwards from it exhausted by his fruitless efforts. While I watched him and searched my brain for some means for his release, another Crow repeatedly swooped down and passed within a few feet or even inches of the poor captive. Both birds were cawing violently. As it was impossible to climb the slender tree I decided to go on to the beach, hoping that in my absence fortune would favor the bird, and that the string might become untangled. On my return an hour later the victim was still tied fast while on the ground a few yards from the foot of the tree and directly in my path was the body of a Crow still warm. No other Crow was in the neighborhood. The dead Crow was a male of normal size as shown by measurements, its plumage was in good condition and it showed every evidence of perfect health. No injury could be found anywhere — there was no sign of hemorrhage under the skin in the abdominal cavity or in the skull. Fat was present in considerable amount, especially about the vicera.

In order to finish the story it may be recorded here that by the forcible bending down of the top of the slender ash so that the captive Crow could be reached from another tree this unfortunate bird (of its sex I am ignorant) was released only to die on the following day. I shall not attempt to answer the question as to the cause of the death of the Crow whose autopsy I have related, but one is tempted to say that he died of grief for the captive one.

During the greater part of the day the roost is deserted, but there is much to be learned of the ways of the Crow even under these conditions. Pellets and droppings are everywhere on the ground under the trees as well as in the surrounding fields and they are especially obvious when the ground is covered with snow. The fact that the snow in the fields near the roost is well trodden by the Crows and spotted with droppings and pellets might lead one to think that the birds had spent the night there, but these studies have shown that the field was merely a reception room where the birds met before retiring for the night.

The pellets which are ejected from the mouths of the birds after a meal and are composed of the useless and indigestible portions of the meal, are cylindrical in shape, rounded at the ends and measure one to two inches in length and about half an inch or more in diameter. In warm or wet weather they speedily break up and mingle with the soil, but in cold weather they freeze and retain their form. A study of these pellets reveals the nature of the corvine dietary. In times of plenty, as in the early fall when berries are everywhere, the Crows are extravagant and wasteful in their feeding habits. Much nourishment is thrown out in these pellets before it has had time to be digested in the stomach. Like the ancient Romans they empty their stomachs that they may feast the more. Crows take no interest in food conservation; the pellets at these times show much wasted food. Not so in severe winters when famine is close at hand. Then every bit of the waxy coat of myrtle berries is digested off and there are no intact cranberries, as in the bounteous autumn, but only the remnants of skin and seeds. At these times also some ashes are to be found in their pellets, as if the birds were trying to quiet the stomach craving by bulk, and hunger had made them bold in visiting the refuse piles

I collected at various times, from November to February, several hundred of these pellets, amounting in bulk to 662 cubic centimeters of material after the pellets were broken up into their composite parts. This I sent on to the Biological Survey at Washington and received from Mr. Nelson, Chief of the Survey, the following report:

"The examination of crow roost material sent in by you has been completed by Mr. Kalmbach. It proved to be a most interesting lot of pellets containing many more specifically different items than are to be found in similar material from roosts in this vicinity. I am appending herewith the result of this examination. The numbers connected with the more abundant seeds are approximate, as they were secured by carefully counting the seeds in a portion of the material and then multiplying to get the total.

#### Insects

- 1 Sphæroderus lecontei (Ground beetle) Trace of another carabid
  - Traces of two other unknown beetles
- 3 Hypera punctata (clover-leaf weevil)

- 1 Sphenophorus sp. (bill-bug)
- 1 Rhodobænus tridecimpunctatus (bill-bug)
- 1 Sitona hispidula (clover-root curculio)
- 17 acridids (shorthorned grasshoppers)
- 2 Gryllus (crickets)
- 1 hymenopteron
- Trace of a fly
- 2 jaws of caterpillar
- 3 small Tineid cocoons

#### Other invertebrates.

Spider fragments and cocoon

Jaws of 3 Nereis sp. (marine worm)

100 Melampus sp.

A few fragments and about 750 operculi of Littorina sp.?

Mytilus sp.

Other mollusk fragments

Parts of a crab

#### Vertebrates.

Bones of fish

Bones and scales of snake

Shell of hen's egg

- 4 Microtus pennsylvanicus (Meadow mouse)
- 1 Condylura cristata (Star-nosed mole)
- 2 Blarina brevicauda (Short-tailed shrew)

Several larger bone fragments (carrion)

#### Plants.

10,000 seeds of Myrica carolinensis (Bayberry)

- 1,200 " "Rhus radicans and R. vernix (Poison Ivy and Poison Sumac)
- 1,100 " "typhina and glabra (Staghorn and Smooth Sumac)
  - 80 " Berberis sp. (Barberry)
  - 360 " "Oxycoccus sp. (Cranberry)
  - 30 " Juniperus sp. (Red Cedar and Low Juniper)
  - 50 " " Smilax sp. (Cat-brier)
  - 100 " " Ilex verticillata (Winter berry)
    - 2 " " Vitis sp. (Grape)
    - 2 " " Solanum sp. (Night shade)

A few kernels of oats and hulls

A few kernels of wheat and hulls

A few kernels of barley and hulls

A few kernels of corn (fragmentary) and hulls

Trace of buckwheat

Fragments of seeds of pumpkin or squash

Seed and skin of apple Pulp of pear (?) Acorn Meat of an unknown nut A piece of rotten wood A piece of cork

Miscellaneous.

A rubber band Gravel

### THE PTERYLOSIS OF THE WILD PIGEON.

#### HUBERT LYMAN CLARK.

RECENTLY, Dr. Jonathan Dwight called my attention to the desirability of placing on record an account of the pterylosis of the Wild Pigeon (*Ectopistes migratorius*), since material suitable for the purpose is accessible to me. For the use of this material, I take pleasure in acknowledging my debt to Mr. Henshaw and Mr. Bangs, of the Museum of Comparative Zoölogy.

The Museum is so fortunate as to have the skin of a very young nestling (M. C. Z. no. 73216) from Wisconsin, which although covered with its nearly uniform coat of neossoptiles yet shows fairly well the main tracts of the pterylosis. This nestling measures about 90 mm. in length, with the bill about 15 mm. more. The skin is light brown, the neossoptiles are rather bright tawny yellow and the feather-buds of the coming contour feathers are nearly black. The wings and little stump of a tail are too badly dried up to make any study of the quills profitable, but perhaps the most striking feature of the pterylosis is the marked development of the "pelvic wing" so well described and figured by Beebe in the White-winged Dove (1915, Zoologica, vol. II, no. 2). In the young Ectopistes this consists of nineteen quills as against eighteen in Melopelia, but owing to the position of the tibia and the dryness. of the skin, it is not possible to determine satisfactorily whether the arrangement of these quills is in reality as different from that shown in Melopelia as it seems to be. Apparently twelve of the quills are on the tibia, crossing its entire width; six and possibly seven of these are main quills and six or perhaps only five are coverts; the outermost are smallest. The other seven feathers are four main quills and three coverts and they lie along the posterior margin of the femur. The two groups of feathers are divided by a break similar to that which separates primaries and secondaries in the wing, but this may be an artificial condition due to the way in which the skin was prepared and dried. It is notable that all the quills of the "pelvic wing" are much more advanced in development than are any of the quills of the wings or tail.

When the main pterylosis of this young Ectopistes is compared with Nitzsch's figure of the condition in Columba livia, we find some striking differences. Dorsally, the upper cervical tract with its limiting apterium on each side and its conspicuous fork between the shoulders is fairly well marked but the branches of the fork are narrower, and the fork itself is deeper. The humeral tracts are evident but narrower than in Columba. The dorsal tract however, instead of having an insignificant apterium, a mere line at its center, is made up of two parts, separated from the cervical fork by a space of 5 or 6 mm. and from each other by a dorsal apterium 3 or 4 mm. wide; the two halves of the tract run nearly parallel to a point about 12 mm. anterior to the oil-gland when they curve inward slightly and unite in a short terminal part about 5 mm. wide, ending at the oil-gland. Each half of the dorsal tract is about four feathers, or 3 mm. wide near its middle, but is much narrower anteriorly. There is no trace of a femoral tract save the inner half of the "pelvic wing." The lower cervical, sternal and ventral tracts in the young Ectopistes are continuous as in Columba but are much narrower. The most striking feature however, is the complete separation of the two sides. In Columba, the lower cervical is a single tract only slightly forked where it joins the sternals, but in Ectopistes (juv.), the fork is so deep, reaching clear to the chin, that the lower cervical tract apparently consists of two entirely separated longitudinal tracts. It is possible that this separation has been accentuated by the way in which the throat has been stuffed in this particular specimen, but I think there is no doubt that in the living bird at this stage, the two parts were separate. At the posterior margin of the sternum, there is a distinct notch on the *inner* side of each ventral tract, which seems to indicate the end of the sternal tract, widest just above the notch. It is not certain that this notch is not an artefact but I believe it would be at least indicated in the living bird. The ventral tracts end at the anus but scarcely surround it. There is no connection between the lower cervical or sternal tracts and the anterior end of the humerals.

The pterylosis of the adult Wild Pigeon has been determined by the study of two excellent alcoholic specimens. Certain features not clearly shown by one are easily distinguished on the other. The striking feature of the pterylosis is the extent to which the tracts cover the bird; the increase in their width during growth from nestling to adult is really extraordinary. Looking at the dorsal surface of the plucked bird the first impression is that there are no apteria but a closer inspection reveals a few small areas free from contour feathers and brings out the fact that the contour feathers are thickly placed on the main tracts and more sparsely distributed on the intervening spaces. The whole upper surface and sides of head and neck are quite uniformly feathered, somewhat sparsely on the occiput but quite densely on the neck. The fork of the upper cervical tract can be distinguished by its thicker feathering but there is no apterium between its halves or between it and the dorsal tract. There are no apteria either between the dorsal tract and the humerals but the intervening skin is uniformly, though not thickly, covered by contour feathers. The humeral tracts are wide and thickly feathered; just outside them there is, on each wing, an apterium about 25 mm. long by 8 mm. wide, running nearly parallel with the humerus. The mid-dorsal apterium is about 60 mm. long, 4 mm. wide at middle and tapering to each end. It is therefore relatively larger than in Nitzsch's figure of Columba, but it is greatly reduced (relatively of course) from the condition shown in the young Ectopistes. At the upper end of each femur there is a small apterium about 10 mm. in vertical length by 7 mm. in width. At the side of the pygidium, at the base of the outer rectrices is a still smaller space not quite 6 mm. square. All the rest of the dorsal surface is covered by the contour feathers of the dorsal and femoral tracts. The outer posterior

series of the femoral tract are composed of relatively large closely placed feathers and there are two or three widely separated series of three or four feathers each on the tibia, but one would never suspect the existence at any time of a "pelvic" wing so conspicuous in the young bird. The oil-gland itself is well developed, has the surface free from feathers, and lacks entirely a terminal tuft of small feathers.

Ventrally the apteria are more marked than on the upper side, yet the covering of contour feathers is very extensive. The two halves of the lower cervical tract are still separated by an apterium 4 mm. wide, as in the young bird, but contour feathers are now present on the chin and upper throat, so that they are united at their upper ends. The pterylosis of the neck in Ectopistes is thus very different from that shown for Columba, in Nitzsch's figure, for there are no lateral cervical apteria in Ectopistes and there is no lower cervical apterium in Columba. The sternal tracts in the Wild Pigeon cover the sides of the breast clear to the wings, connecting with the humeral tract above and extending far out on the humerus below; there is a small apterium on the side of the breast just beneath the head of the humerus. Posteriorly the sternal tracts run into the femorals on the side and extend upward to merge into the dorsal tract. There is a little triangular apterium, with sides about 8 mm. long, just anterior to the middle of the femoral tract, but excepting this space and the one at the upper end of the femur, the sides of the bird are entirely clothed in contour feathers. The sternals pass without a break or even a notch into the broad but short ventral tracts. These do not reach the anus nor do they meet each other clearly in the midventral line. Posterior to them is a rather large and distinct area, lacking contour feathers, but the lower side of the pygidium is well feathered. The ventral apterium is only 5 or 6 mm. wide over the crop, but becomes 20 mm, wide at the middle of the sternum and is 10 mm, wide on the belly.

The wing shows four well-developed feathers in the alula, ten long primaries and fourteen visible secondaries, but the "fifth" secondary is conspicuous by its absence! The relative length of the primaries is 9, 10, 8, 7, 6, 5, 4, 3, 2, 1. There are twelve rectrices, their relative lengths being 1, 2, 3, 4, 5, 6; i. e. the middle

pair longest, the outer shortest. Rectrix 1 is inserted almost directly above 2 but the others lie in the same plane. There are six major upper coverts on each side, but 6 is quite small and lies close beside 5 above rectrix 5, while covert 1 though large is pushed outward by the position of rectrix 1 and so lies nearly over rectrix 2. There are six major lower coverts but they lie beneath rectrices 2-5; covert 1 is largest and covert 6 is smallest.

The feathering of the lower part of the legs is sparse but continues down on the front of the tarsus 10-12 mm. Posteriorly the feathers do not extend over the joint.

If the above account of the pterylosis of the Wild Pigeon be compared with the account and figures of the pterylosis of the Columbidæ given by Nitzsch, it is evident that Ectopistes has a distinctive arrangement of its feather tracts, of which the most striking character is their tendency to merge with each other. Comparison of the pterylosis of the adult and young Wild Pigeon reveals the highly interesting and important fact that the nearly uniform feather coat of the adult is not a primitive but a secondary condition, just as is known to be the case with the nearly uniform feathering of the ostrich. Perhaps the usual opinion that a uniform coat of feathers was the original condition from which specialized pterylæ have been derived, may prove to be a mistake.

# SEXUAL SELECTION AND BIRD SONG.

#### BY CHAUNCEY J. HAWKINS.

The place of song in the life of the bird has since the days of Darwin been a question of dispute between the scientists. Darwin was the first to deal with bird song in a satisfactory philosophical manner. He formulated the theory of sexual selection which down to the present day is still held by many ornithologists to be the most satisfactory explanation of the use of song as well as the best explanation of its evolution. He maintained that the males possessing the best song would naturally be the choice of the females; and that the song characteristics which had made a male the choice of his mate would naturally be handed on to his offspring, in other words, would become secondary sexual characters. This Darwin called sexual selection in distinction to natural selection whose operation had a wider scope.

To do Darwin justice we should state the theory in his own language; Sexual selection "depends on the advantage which certain individuals have over others of the same sex and species solely in respect of reproduction."....In cases where "the males have acquired their present structure, not from having transmitted this advantage to their male offspring alone, sexual selection must have come into action."...." A slight degree of variability, leading to some advantage, however slight, in reiterated deadly contests, would suffice for the work of sexual selection."....So too, on the other hand, the females "have, by a long selection of the more attractive males, added to their beauty or other attractive qualities."...." If any man can in a short time give elegant carriage and beauty to his bantams, according to his standard of beauty, I can see no reason to doubt that female birds, by selecting during thousands of generations the most melodious or beautiful males, according to their standard of beauty, might produce a marked effect." "It has been shown that the largest number of vigorous offspring will be reared from the pairing of the strongest and best armed males, victorious in contests over other males, with the

most vigorous and best nourished females, which are the first to breed in the spring. If such females select the more attractive, and at the same time vigorous males, they will rear a larger number of offspring than the retarded females which must pair with the less vigorous and less attractive males. So it will be if the more vigorous males select the more attractive, and at the same time healthy and vigorous females; and this will especially hold good if the male defends the female and aids in providing food for the young. The advantage thus gained by the more vigorous pair in rearing a larger number of offspring, has apparently sufficed to render sexual selection efficient."

Wallace was the first critic of the sexual selection theory. He admits that the display of gorgeous colors, the antics and songs of the male bird before the female, as fully demonstrated by Darwin but he says, "it by no means follows that slight difference in the shape, pattern, or colors of the ornamental plumes are what lead a female to give the preference to one male over another; still less that all the females of a species, or the great majority of them, over a wide area of country or for many successive generations prefer exactly the same modifications of colors or ornament." Thus he rules out the idea that the female makes a conscious choice of the male most highly colored or who is the best singer. But this does not destroy the idea that there may be an unconscious choice. Indeed, Wallace seems to admit this possibility when he says, "As all the evidence goes to show that, so far as female birds exercise any choice, it is of the most 'vigorous, defiant, and mettlesome' males, this form of sexual selection will act in the same direction (as natural selection), and help to carry on the process of plume development to its culmination." If this choice exercised by the female is unconscious rather than conscious, Darwin's theory is not vitally affected. All he is anxious to demonstrate is that the most vigorous bird succeeds in winning the most desirable mate, however the choice may be made, and if he succeeds in this the bird may pass to his offspring his own characters which in succeeding generations will become permanent.

But Wallace goes deeper in his criticism than the mere matter of choice. He attributes the origin of song to natural selection rather than to sexual selection. Darwin begins with sober colors and attributes the gay colors of the males to selection on the part of the female. Wallace starts with the gorgeous colors and declares that the gray colors of the females are due to natural selection. Bright plumage would render the mother bird sitting on her nest conspicuous and make her the easy prey to hawks and other natural enemies. Hence all the highly colored females, through generations have been destroyed, only the more sober colored birds remaining. "The original brightness has been forfeited by the sex as a ransom for life. Female birds in open nests are similarly colored like their surroundings; while in those birds where the nests are domed or covered, the plumage is gay in both sexes."

The same principle of natural selection may be attributed to the call of birds. "These are evidently a valuable addition to the means of recognition of the two sexes, and are a further indication that the pairing season has arrived; and the production, intensification, and differentiation of these sounds and odours are clearly within the power of natural selection. The same remark will apply to the peculiar calls of birds, and even to the singing of the males. These may well have originated merely as a means of recognition between the two sexes of a species and as an invitation from the male to the female bird. When the individuals of a species are widely scattered, such a call must be of great importance in enabling pairing to take place as easily as possible and thus the clearness, loudness, and individuality of the song becomes a useful character, and therefore the subject of natural selection."

The increase and development of beautiful plumage is caused by the superabundant energy of the male bird. "During excitement and when the organism develops superabundant energy, many animals find it pleasurable to exercise their various muscles, often in fantastic ways, as seen in the gambols of kittens, lambs, and other young animals. But at the time of pairing male birds are in a state of the most perfect development, and possess an enormous store of vitality, and under the excitement of the sexual passion they perform strange antics or rapid flights, as much probably from the internal impulse to motion and exertion as with any desire to please their mates." So, also, "the act of singing is evidently a pleasurable one, and it probably serves as an outlet for superabundant nervous energy and excitement, just as dancing, singing, and field sports

do with us." If superabundant vigor can account for the songs and ornaments of birds "then no other mode of selection is needed to account for the presence of such ornament."

Brooks attacks the theory of Wallace that the duller colors of the female are acquired by natural selection. Thus there is found a difference in the colors of lizards where the female does not incubate and does not require the duller colors for the purpose of protection. In domestic fowl where danger from natural enemies is almost nothing the same difference in the color between the male and female continues. Thus the explanation is more fundamental than the one proposed by either Darwin or Wallace. Brooks bases his explanation upon a theory of heredity which supposes that the body gives off gemmules and that "the male reproductive cell has gradually acquired, as its special and distinctive function, a peculiar power to gather and store up these gemmules." The male cell, therefore, has acquired the power to transmit variation while the female cell keeps up the constancy of the species. "We thus look to the cells of the male body for the origin of most of the variations through which the species has attained its present organization." Darwin said that the plumage and song of the male bird were transmitted by the selection on the part of the female of the gayest bird and the best singer. Brooks goes deeper and finds the cause for these secondary sexual characteristics in the power of the male cell to transmit the variations. He does not deny that the female may choose the best singer but affirms that the male must lead in variations from his very nature.

Geddes and Thompson carry forward still further the criticism of Wallace and Brooks. Wallace accounts, on the theory of natural selection, for the dull colors of the female and for the more brilliant colors and song of the male. Darwin on the other hand rivets his attention upon the gorgeous colors, the plumes, combs and wattles of the male, accounting for them by the theory of sexual selection but fails to tell us why the same process does not brighten up the coat of the female. The mere statement of the position must make it clear that there is some deeper cause than that discovered by either Darwin or Wallace, some internal factor much more powerful in its operation than any external cause. Geddes and Thompson finds this in the essential difference be-

tween the sexes. "The females incline to passivity, the males to activity. The female cochineal insect "spends much of its life like a mere quiescent gall on the cactus plant. The male, on the other hand, in his adult stage is agile, restless, and shortlived." So with the other insects and other animals. The male is more active while the female is passive.

"For completeness of argument, two other facts may here be simply mentioned. (a) At the very threshold of sex-difference, we find that a little active cell or spore, unable to develop itself, unites in fatigue with a larger more quiescent individual. Here, at the very first is the contrast between male and female. (b) The same antithesis is seen, when we contrast the actively motile, minute, male element of most animals and many plants, with the larger passively quiescent female-cell or ovum.

"To the above contrast of general habit, two other items may be added, on which accurate observation is still unfortunately very restricted. In some cases the body temperature, which is an index to the pitch of life, is distinctly lower in the females, and has been noted in cases so widely separate as the human species, insects, and plants. In many cases, furthermore, the longevity of the female is much greater. Such a fact as that women pay lower insurance premiums than do men, is often popularly accounted for by their greater immunity from accident, but the greater normal longevity on which the actuary calculates, has, as we begin to see, a far deeper and constitutional explanation.

"The agility of males is not merely an adaptation to enable that sex to exercise its functions with relation to the other, but is a natural characteristic of the constitutional activity of maleness; and the small size of many male fishes is not an advantage at all, but simply again the result of the contrast between the more vegetative growth of the female and the costly activity of the male So brilliancy of colour, exhuberance of hair and feathers, activity of scent glands, and even the development of weapons, cannot be satisfactorily explained by sexual selection alone, for this is merely a secondary factor. In origin and continued development they are outcrops of a male as opposed to a female constitution. To sum up the position in a paradox, all secondary sexual characters are at bottom primary, and are expressions of the same general habit

of body (or to use the medical term, diathesis), as that which results in the production of male elements in the one case, or female elements in the other."

This essential difference between the two sexes which expresses itself in differences of plumage and song is further emphasized by the facts, first, that many of the secondary sexual characters appear only at sexual maturity. Thus some of the male birds are dull colored when young like the female and acquire the brighter colors only on full development. Again when the sex organs are removed by castration the male ornaments or weapons of battle disappear. In cattle castration reduces the size of the horns and after castration of the stag he never renews his antlers.

In the case of young cocks the effects of castration are very variable, sometimes increasing, sometimes decreasing the secondary sex characters. One result is clear, however, that the whole body is affected; the larynx is intermediate in size between that of cock and hen, the syrinx is weakly developed and the capons seldom crow or do so abnormally, the brain and heart are lighter in weight, fat accumulates in the subcutaneous and subserous connective tissues, and the skeleton shows many abnormalities.

The conclusion seems inevitable that neither Darwin nor Wallace reached the root of this matter. "The males are stronger, handsomer, or more emotional, simply because they are males, i. e. of more active physiological habit than their mates." This view does not wholly eliminate either natural or sexual selection. These may be limiting, and, in a sense, directive factors, but it is fundamentally the nature of sex which determines the gay color or the vigorous song.

To complete our review of this controversy which has been waged between ornithologists, we must record some of the more recent discussions of the Darwinian theory of sexual selection. Hudson says; "The result of such independent investigation will be a conviction that conscious sexual selection on the part of the female is not the cause of music and dancing performances in birds, nor of the brighter colors and ornaments that distinguish the male. It is true that the females of some species, both in the vertebrate and insect kingdoms, do exercise a preference; but in a vast majority of species the male takes the female he finds, or that he is

able to win from other competitors; and if we go to the reptile class we find that in the ophidian order, which excels in variety and richness of colour, there is no such thing as preferential mating; and if we go to the insect class, we find that in butterflies, which surpass all other creatures in their glorious beauty, the female gives herself up to the embrace of the first male that appears, or else is captured by the strongest male, just as she might be by a mantis or some other rapacious insect." He accounts for the singing of birds by the abounding energy of birds. "We see that the inferior animals, when the conditions of life are favorable, are subject to periodical fits of gladness, affecting them powerfully and standing out in vivid contrast to their ordinary temper. And we know what this feeling is - this periodic intense elation which even civilized man occasionally experiences when in perfect health, more especially when young. There are moments when he is mad with joy, when he cannot keep still, when his impulse is to sing and shout aloud and laugh at nothing, to run and leap and exert himself in some extravagant way. Among the heavier mammalians the feeling is manifested in loud noises, bellowings and screamings, and in lumbering, uncouth motions - throwing up heels, pretended panics, and ponderous mock battles."

This is simply a repetition of Herbert Spencer's surplus energy theory which was based on the earlier theory of Schiller who in his letters 'On the Æsthetic Education of Mankind' wrote: "Nature has indeed granted, even to the creature devoid of reason more than the mere necessities of existence, and into the darkness of animal life has allowed a gleam of freedom to penetrate here and there. When hunger no longer torments the lion, and no beast of prey appears for him to fight, then his unemployed power finds another outlet. He fills the wilderness with his wild roars and his exuberant strength spends itself in aimless activity. In the mere joy of existence, insects swarm in the sunshine, and it is certainly not always the cry of want that we hear in the melodious rhythm of bird songs. There is evidently freedom in these manifestations, but not freedom from all necessity. The animal works when some want is the motive of his activity, and plays when a superabundance of energy forms his motive when overflowing life itself urges him to action."

It is too superficial a theory to satisfy the modern mind. We are compelled to ask the question, why does the male bird have more surplus energy than the female? This question throws us back to a consideration of the fundamental difference between the male and the female. There is only one answer to that question. The male sings more vigorously because he is a male, in other words because there is some fundamental difference between the sexes.

Karl Groos has contributed one very serious modification of the Darwinian theory which has not been given sufficient consideration by ornithologists, namely, that the song and antics of the male bird are not for the purpose of compelling her choice by the female but to overcome and break down her instinctive coyness. Nature has given the female coyness as a dam to nature's impulses to prevent the "too early and too frequent yielding to the sexual impulse." A high degree of excitement is necessary to break this down and hence the necessity for all the vigorous songs and antics of the male.

I am confident that this theory is destined to find wider acceptance in the future than it has in the past, indeed, that a large part of the song of birds before the nesting season is for the purpose of breaking down the reluctance of the female rather than compelling her choice of a particular male. At Bakersfield, California, I spent an hour watching a male Flicker sitting on a small limb a foot or more above his mate while both birds went through motions that were interesting and at times almost ludicrous. The proud male would extend his head in a line with his body, then turn both body and neck first to one side and then the other, like a weather vane hung on a central shaft, at the same time jerking his head back and forth in a sort of kick-up motion, and pouring out all the time a quick succession of notes which might be represented by the words pick-up, pick-up, pick-up, closing the whole performance by a right-about-face, when he would rest a minute and repeat the process. His less gaily colored mate was not so vigorous in her antics as her proud lord nor did she indulge in them so frequently but it was evident that he was making his impression and she could not refrain from expressing her feelings. I was certain that these birds had mated their lives "for better, for worse." Hence the love song could not have been for the purpose of mating but to

furnish the necessary excitation to make productive the season that was at hand for the reproduction of their race. There is no other explanation that can be given for birds already mated, unless it be that of the overflow of superabundant energy and this is too superficial an explanation for the deep laid plans of mother nature. Were this the only cause for the songs and antics of birds the mere overflow of nature might never terminate in anything or it might lead to unregulated abuse. But nature protects and regulates her ways by safety valves, of which the reluctance of the female is one, and this must be overcome before the reproductive process can become effective.

This view seems to be strengthened by the fact that the display of song and antics is used by polygamous birds and animals as well as by those which mate for the season or for life. The rooster with his harem about the barnyard is just as vigorous in his performances as the bird which is devoted to his single mate. The doe in her breeding time calls to the buck who rushes to her side, then she, "half in coyness, half in mischief, takes to flight at his eager approach, makes towards an open space, and runs in a circle. The buck naturally follows, and the chase grows hot and exciting as a race of horses on a track. To the frequent high calls of the fleeing doe are added the deep, short cries of the panting buck; but suddenly the roguish doe disappears like a nymph into the thicket near at hand, and the baffled buck stands with head erect and ears thrown forward; then we see his head lowered as he catches the scent, and he too vanishes in the wood." But this deer is a polygamist and his antics cannot be for the purpose of mating.

Watch the finch as he dances about his mate, fairly losing himself in a frenzy of ecstasy, flashing his wings in a wild delight and prancing about and chattering, the antics of the noisy street sparrow, the prancing and cooing of the pigeons, and there is only one evident conclusion. It is not for the purpose of mating but the more immediate purpose of hastening the female to fulfill her natural function. There are times when two or more males are involved in these antics, in which case there must be at least an unconscious choice on the part of the female, or a battle royal which will drive the competing males away, but in the vast majority of cases there is only one ardent male bird in the presence of the female and he is often the bird with which she has already mated.

A weakness of the sexual selection theory that has not been given sufficient consideration is that the song of birds has been treated too exclusively in connection with the mating season. Men have riveted their attention on those rapturous bursts of song which precede and continue through the mating time, and have given too little attention to the fact that few birds are ever wholly voiceless, that most birds speak the sign or voice language, at least to some extent, all through the year.

Most of our best singers have two distinct song periods. One begins with the arrival of the advance guards of the migrating hosts and continues until the broods of young birds are hatched. When the young birds have left the nest and are able to care for themselves there is a cessation of the full, joyous songs, September being generally the silent month. Then many of the birds begin to sing the last of September or the first of October and continue until November. Bicknell has determined definitely the limits of these song periods for many of our birds. The House Wren begins to sing its love song in April and continues to the last of July or the first of August. After a period of comparative silence it begins its autumn song which has none of the spontaneity of the spring song but consists of a "low rambling warble" which continues to the middle of October. The Black and White Creeping Warbler sings from April to the late June. Its second period begins from the ninth to the twenty-second of August and lasts only a few days. The first period of the Oven-bird stops by the end of June. The second period begins in August, at first haltingly, as though it had forgotten how to sing, but finally bursts into full song by October. The Wood Thrush sings from its arrival in late April or early May until the middle of August. It is not heard again until October and then only the call notes, never the full song.

Bicknell attributes this period of silence to the moult of the bird. In many cases the moulting periods of our song-birds correspond more or less closely with periods of silence, voice being renewed with the renewal of plumage. The general statement may therefore be made, that birds are predisposed towards silence during the height of the moult. Though this fact may by many be regarded

as one not requiring demonstration, it is by no means without exceptions. In the earlier and later stages of the moult the vigor of the birds in general seems little impaired. Not only do many species enter on their migrations while yet the moult is in progress or before the complete maturity of their renewal plumage but birds may be found sitting upon their eggs with evident indications of activity on the growth of feathers. Still we must regard it as a general fact that singing and moulting are in some degree complementary.

Some birds have no second song period. The Catbird sings from April through July but it is not heard in the autumn. The Brown Thrasher sings from April to the first week in July but is silent in October. After August the Scarlet Tanager is not heard again in full song. Where this second period is lacking it is probably due to the excessive fatness of the bird. Thus the Scarlet Tanager undergoes its moult in August. The growth of the new feathers continues until October when the bird becomes very fat. The Wood Thrush moults in August but is not fat. By the last of September its plumage is nearly perfect and the bird is fat. Hence the song seems to be interrupted first by the moult and then by the adipose condition.

There are some cases where the birds' best song is outside of the mating season. It is a significant fact that the male birds arrive first in the migration and soon after their arrival begin their full song though there are no females to hear. It may be said this is for the purpose of attracting the females on their arrival or that the male is practising his art but this seems too superficial an explanation. There must be something within the bird himself which causes him to sing though there is no ear to listen. Hudson calls attention to a small yellow field finch of La Plata which does its best singing in August. There birds gather in great flocks in the tops of trees and sing in concert, producing a "great volume of sound, as of a high wind when heard at a distance." Later this choir breaks up, love infects the individuals, and they scatter over fields and pasture lands. But during courtship the male has only a feeble, sketchy song.

There are birds which sing more or less the entire year. Hudson found several birds in Patagonia with good voices, one a mocking-

bird, which were autumn and winter songsters. Olive Thorne Miller tells of a Gray-checked Thrush in captivity which sang all winter. "All through the long winter this charming thrush, with his two neighbors delighted the house with his peculiar and matchless music, and endeared himself by his gentle and lovely disposition. No harsh sound was ever heard from him, there was no intrusion upon the rights of others, and no vulgar quarrels disturbed his serene soul." (In Nesting Time, pp. 168-169.) The voice of the Crow is as vigorous in January as in June and while I write these lines, in February, a Blue Jay is screaming from a tree in a neighbor's yard as though April had come. The Chickadee sends out his cheery song the coldest day in winter with almost as much vim as he does in the nesting time. The metallic notes of the Flicker ring over the hill sides through the coldest months with a vigor becoming the hardy bird. Indeed, the man who goes forth into the New England hills in winter, especially if the sun happens to be shining brightly, must be impressed by the number of bird notes he will hear during the day. I went forth one day in January when the earth was encased in ice, over which was a thin layer of fluffy snow. A strong wind was blowing, whipping the bare branches of the trees. The thermometer was low and the air stinging, surely as unfavorable a day as one could find for birds. What was my delight to find a large flock of Robins and another of Goldfinches. The latter were as active and cheerful as though it had been a day in May. Defying the wind, they were in the tree tops, swinging on the tips of the branches, sometimes hanging up side down, hunting eagerly for food. And from the tops of the trees their sweet, unobtrusive notes dropped down like bubbles of melody floating leisurely through the air. They were such a friendly company, no one showing jealousy because another had been more fortunate in finding food. Their concert of song was a free expression of their genial disposition, some birds uttering only single notes while others rolled out three or four syllables. I never heard a more hearty Goldfinch chorus in the spring than they uttered on this cold January day, except it was not quite so loud as in April. The Robins showed more effect of the cold weather, sitting on a branch with their feathers fluffed out, as though to increase the size of their feather coat, but with all their discomfort

they too indulged in song. Most of them gave the single Robin note but occasionally a more ambitious bird would roll out a longer phrase, one bird answering another that called from a distant tree. Then the entire flock would rise on wing, chirping as they flew, as though glad they were living and could not withhold an expression of their joy. From the top of the pines the Crows cawed at each other, tipping their bodies as they called in a tilting motion, and protruding their necks and heads with each note.

The fact that is too seldom taken into consideration is that while the bird usually sings his most vigorous song and indulges in his most frantic efforts around the nesting season, he does use his voice at other times during the year, that there are few birds that are entirely voiceless at any time. Sometimes he utters only a call note, again the note of alarm, caused by sudden flight, while again he sings apparently only for the pure joy of living. But throughout each month of the year either a sign or spoken language plays a part in the ceremony of his existence. His song is not merely a thing related to his sexual life. It has a relationship to his total existence. It is no more to be explained by the principle of sexual selection than is the existence of the human voice, even in its higher and finer modulation, by the same law. It is the means by which the bird expresses himself to the outer world. It is used according to the need of the hour or the season, the instrument by which the bird communicates his needs or feelings.

It is significant in this connection that so little has been said concerning the voice of the female. The question may reasonably be raised whether her voice is not much more important in nature's scheme than that of the male. He is a much more ardent, vigorous and accomplished singer. But after all that can be said about his song the fact remains that it is not so very important. It is a sort of grandstand performance. He is a sort of trobadour who comes forth to please those who hear but it contributes nothing we can see toward the protection or rearing of the young. But who that has listened to the sweet, low notes of the mother to her young or the alarm notes or clucks which cause her helpless brood to run to hiding, can doubt that the voice of this female is very important in the struggle for existence. If the purpose of selection is the improvement of the race why might not some genius show that

the males select the mate with the best cluck or call for the protection of her brood? It would certainly be a theory far more in harmony with nature's plans. But, while no person would probably have the courage to prove such a theory, it cannot be doubted that the female has a language and that it is far more important in the preservation of the race than the more modulated language of the male.

All of these facts must be taken into consideration before we can adequately account for the song of birds. The sexual selection theory is based too exclusively upon one period in the bird's life. The bird has more than one season of song and there is no month of the year when his voice does not play some part in his life. The female has a language as well as the male. It must be evident that any explanation which will be adequate to account for bird language must cover every season and must be found in the inner life of the bird rather than in outward circumstances or choices.

Again there are certain types of sign language which are much more universal among birds than has generally been assumed. Much emphasis has been placed upon the displays and love dances of pheasants and birds of paradise which, it has been assumed, was the cause of the beautiful plumage of these birds. The female choosing the best performer or the most highly colored male has resulted through slight modification, generation after generation, in these elaborate decorations. But we have, since Darwin, discovered that the love dance or display is in some measure used by many birds, often birds of dull color, like the English Sparrow, and they are still, in spite of the love dance, dressed in gay or sober plumage. Howard, in his remarkable 'History of the British Warblers,' has shown "that these birds of sober hues perform during moments of sexual exaltation, antics which in every way reflect the display supposed to be peculiar to birds of brilliant plumage." Savi's Warbler, also, indulges in these antics even when feeding his young. Furthermore, these dances are not confined to the period of courtship.

From whatever point of view we approach this subject the evidence is so strong that we are compelled to look for our explanation in the internal life of the bird rather than in any external, exciting cause. Most of the theories thus far set forth have in

them an element of truth. If the purpose of song is excitation of the female to break down her coyness, this very act may compel her to exercise an unconscious choice and thus sexual selection may exert a limiting and directive force in the life of the bird. Even Hudson's theory that the bird sings out of the abundance of its very being, joy and life, is not to be ignored. But the question forces itself upon us, why does the bird sing and dance to overcome the female coyness and what gives the male more vitality than the female? The answers to these questions force us back into the inner life of the bird to seek our answer in the essential difference between the sexes.

So far as song, as well as other displays, in the mating season are concerned they are due to the ripening of the sexual glands from which, as Pycraft has shown, hormones "are set free, and, pervading the body, stimulate the nervous system, and at the same time the secondary sexual characters - the antlers of the stag, the mammary glands of the female, the 'breeding plumage' of the bird. When they are obviously secondary sexual characters, as in the case of dull colored birds, the result is the same, a state of physical exaltation expressed in 'display.' Males or females wherein these 'hormones' are but feebly developed, display and respond indifferently, and so cease to please the opposite sex. As Mr. Howard has pointed out, in the case of the Warblers, no amount of display on the part of the male will avail until the female has attained a like pitch of preparedness for the work of procreation. The courtship of the ruffs and reeves, already referred to, afford another illustration. Here it will be remembered the males for weeks spend laborious days in endeavoring to gain some responsive sign from their prospective but phlegmatic mates, yet without receiving the slightest sign of encouragement or recognition. As soon, however, as the female has become 'sexually ripe,' as soon as the hormones secreted by her generative glands have done their work, she herself indulges in a species of nuptial dance, waltzing round her lord, and setting down before him with her tail directed toward his head. Thus the sexual activity displayed by the male comes to mean simply that he is more ardent at this time than his mate. The advantage of this is obvious: for thereby the more vigorous males, by proclaiming their desire to pair, defeat their

less vigorous rivals, who might otherwise be chosen. The earlier they can take the field, the more persistent their advances, the greater their chance of ultimate success, and this because they slowly instil a preference which cannot be overcome by later and less virile comers."

This fact makes it clear why many of the sober tinted birds are as ardent in their love dances and displays as some of the more brilliantly colored birds like the peacock and the pheasant. It may also explain why some of the more beautifully colored birds sing as vigorously as the duller tinted species. Their nervous system is in a condition of intense stimulation through the action of secretions thrown off by the sex glands. But the important fact is that it completely modifies the theory of sexual selection, so modifying it that there is little of the significance attributed to it by Darwin and his followers remaining. The antics, display and songs of birds are germinal variations which have survived and are not the result of conscious or unconscious choice on the part of the female. This is "borne out by the fact that birds of the most sober hues affect displays of a character precisely similar in kind to those of birds in which this display appears to be made for the sole purpose of exhibiting to the best advantage some specially modified or beautiful colored feathers."

This view which seeks the cause of song in the internal life of the bird rather than in external causes, also gives a more satisfactory view of the total language of the bird, the call and alarm notes, the gentle notes of the mother bird over her young and the songs that are uttered outside of the mating season. The sexual selection theory has fallen down, in my judgment, from the fact that it has confined itself too exclusively with one short period in the language of the bird. It has failed almost exclusively to recognize that birds have a language which extends throughout the entire year, either sign or tone language, and that there must be something in the feathered creature which will account for this less vigorous expression of life and needs which occur outside of the mating season. It is here that the theory of germinal variations comes to our assistance. Voice having originated in the hisses and groans of the reptile, it was inevitable that there should be a difference both of tone and vigor between the male and female

birds, due to the essential difference of sex and any variations in voice which might arise would be preserved in the male germ which assures the variation in the species while the germ of the female guarantees the constancy of the species.

# SOME ADDITIONS AND OTHER RECORDS NEW TO THE ORNITHOLOGY OF SOUTH CAROLINA.

## BY ARTHUR T. WAYNE.

SINCE 'My Birds of South Carolina' was published in 1910, I wish to announce the addition of four species new to the fauna as well as the noteworthy capture of many birds, and the early breeding of Bachman's Warbler. Information of this kind is gained slowly, and requires constant, if not daily, exploration of fields, forests, and water areas.

Puffinus griseus. Sooty Shearwater.— A specimen of this species was picked up dead on the beach of Bull's Island on, or about, the last of May, 1916, by Mr. Clarence Magwood. I examined the bird about a week after it was found. This date probably represents the time when the birds make their appearance in the spring on the South Carolina coast.

Histrionicus histrionicus. Harlequin Duck.— During the intensely cold weather which began on December 30, 1917, and continued through the third week of January, 1918, I was constantly on the lookout for far northern birds. On January 14, I saw four of these ducks, and on the 16th, I saw two more near the place where the first were seen on January 14. These ducks were probably not more than 75 or 80 yards from me and the identification was established without a doubt despite the fact that I was unable to shoot one. All the examples were in the plumage of the female and must have been that sex or else young males of the first winter plumage. Near at hand were small flocks of Buffle-head (Charitonetta albeola), Old-squaw (Harelda hyemalis), and Ruddy Ducks (Erismatura jamaicensis), and the Harlequin's were easily identified. This is an addition to the avifauna of South Carolina.

Chen hyperboreus hyperboreus. Snow Goose.— On October 16, 1916, Mr. Lucian L. Porcher shot on Porcher's plantation, Christ Church

Parish, a beautiful young female of this species and gave it to me, which is now in my collection. This specimen is very small and scarcely larger than Ross's Snow Goose (*Chen rossi*). The form of the Snow Goose that was known to occur in South Carolina was the Greater Snow Goose (*Chen hyperboreus nivalis*), therefore the capture of *C. h. hyperboreus* is an addition to the ornithology of South Carolina.

Chen cærulescens. Blue Goose.— Among a small collection of birds at the Santee Gun Club, Santee River, is a fine specimen of this bird, being shot on the preserves of the Club by Mr. Frank Carnegie, and presented by him to the Club. Mr. Carnegie shot this goose about ten years ago. This is another addition to the fauna of South Carolina.

Herodias egretta. Egret.— On December 18, 1917, I saw a beautiful specimen of this bird flying near at hand over a frozen pond near my home. Heretofore I have not observed this species later in the autumn than the first week in November, for this bird is susceptible to cold. I could easily have procured it, but as I never molest them at any season, hoping for those remaining to increase, I let it remain. I, however, did not observe it again after the intense cold, beginning on December 30, and which lasted uninterruptedly until the third week in January, 1918, therefore the bird undoubtedly migrated.

Nyctanassa violacea. Yellow-crowned Night Heron.— A most exquisite specimen of this heron that I shot on October 5, 1916, according to Mr. Ridgway's 'Color Standards and Color Nomenclature,' 1912, has the back, wings and upper parts (exclusive of head) 7 Deep Gull Gray, while the under parts are near to the shade 8 Gull Gray. The forehead, crown, and occiput are white or yellowish white in which are numerous chestnut or reddish brown feathers. Although this lovely bird is in fresh, unworn, autumnal plumage the occipital feathers and the long dorsal plumes of the supposed breeding plumage are present and as perfectly developed as in the latter season. The specimen is the largest I have yet seen or taken, and my experience with this bird goes back to 1884. I realized as soon as I saw it near at hand that it was the most beautiful example I had ever seen.

Numerius hudsonicus. Hudsonian Curlew.— On December 11, 1917, while I was en route to Long Island (Isle of Palms) in search of Ipswich Sparrows (Passerculus princeps) I heard, then saw, a Hudsonian Curlew near Bullyard Sound (Santee Path). 'The case was so novel that I could scarcely believe my ears and eyes, as the latest record upon which I had detected this bird in the autumn was October 2, 1885, when I shot two on Sullivan's Island. I determined to obtain this bird, as the desire of possession of a winter example was most keen with me!

The bird was very shy and flew about a half mile to an adjacent sound where I marked it in a superficial manner. About this time the wind began to blow hard from the northeast with about freezing temperature. I followed this bird from place to place and, after firing six shots at it at long range, I finally secured it with a heavy charge on my seventh shot.

The specimen was not crippled, being very fat and very wild, and is in fine, unworn plumage. Although Audubon 1 says that "I once saw a large flock of them near Charleston, in the month of December," he must have confused this species with the Long-billed Curlew (Numenius americanus) which latter bird wintered along the South Carolina coast in vast numbers up to 1885 or a few years later.

Arenaria interpres interpres. Turnstone. - On May 30, 1918, I shot on Dewees Island five birds at one shot and from the same flock, all of which are in perfect nuptial plumage. One specimen — an adult male having more black in the upper parts than any individual I had previously taken led me to compare it with an European specimen, Mr. J. H. Riley having sent me an adult male from the U.S. National Museum collection taken at Havre, France, on May 15, 1875. This French bird has the wing 51 inches, and the wing of the South Carolina specimen is of the same length. According to 'The Water Fowl Family' Dr. Bishop gives the wing measurement for A. interpres as more than 6 inches, and for A. interpres morinella as under 6 inches. The South Carolina bird is identical in coloration with the European except that it has more reddish in the wing-coverts; and if interpres is really distinct from morinella (which is doubtful, as a typical morinella in coloration has the wing more than 6 inches) an European bird-has been added to the fauna of South Carolina. Ruddy Turnstone's, i. e. males in perfect nuptial plumage, vary endlessly in the amount of black in the upper parts. A lovely male taken by me on May 26, 1910, has very little black on the upper parts, the reddish color everywhere prevailing. The specimen taken May 30, 1918, that is referable to A. i. interpres, has two coal black feathers among the white feathers of the abdominal regions.

Falco columbarius columbarius. Pigeon Hawk.— While watching a pair of Rough-winged Swallows (Stelgidopteryx serripennis) building a nest in an ancient limekiln from which a round limb had rotted leaving a long, round symmetrical hole, in which the Swallows were depositing pieces of sedge on May 15, 1918, a Pigeon Hawk attacked and caught a Barn Swallow (Hirundo erythrogastra) with superlative ease and flew with it first to the beach then to a high, dead pine about 400 yards away. I hastened to the tree hoping to secure it; but as I was almost in proper range the hawk which had already devoured the swallow flew to such a distance that I could no longer follow it with my eyes.

The Pigeon Hawk is now a very rare bird on the coast of South Carolina and has always been very rare in the spring, the last time I observed one was on April 13, 1900, an adult male in beautiful plumage, that I shot, and which is now in my collection.

Myiarchus crinitus. Crested Flycatcher.—On December 11, 1914, I heard the note of a Crested Flycatcher and upon following the

sound found the bird perched upon a tall water oak tree in a large forest. Although the ponds were frozen over this bird was calling as though it was the month of May or June, and it was indeed an anomaly! I collected the bird. The specimen is in fine, unworn plumage and was very fat. Had I not shot this bird it would have undoubtedly wintered. It is now in my collection.

Quiscalus quiscula æneus. Bronzed Grackle.—I shot on March 14, 1918, a superb adult male of this bird near Mount Pleasant. I was following some Florida Grackles through a large dense swamp trying to collect a large male, but the birds were so wild it was difficult to get within range. At last I hid behind a large tree and a large bird came within range which I promptly shot. Upon securing it I was surprised to find that I had at last taken a Bronzed Grackle, which is an addition to the fauna of the coast.

The Bronzed Grackle is without doubt a species, as I cannot find any intergradation among specimens taken from South Carolina to Kansas.

Quiscalus quiscula quiscula. Carolina Grackle.— The type locality of this Grackle is stated to be South Carolina founded on *The Purple Jack Daw, Monedula purpurea*. Catesby, Nat. Hist. Carolina, I, 1731, 12, pl. 12, in Linnæus' Syst. Nat., ed. 10, I, 1758, 109.

An examination of the text of Catesby's book, however, proves conclusively that the birds to which he refers were in reality the Florida Grackle (Quiscalus q. aglæus). Catesby's birds undoubtedly came from the coast of South Carolina. He says: "They make their Nests on the branches of trees in all parts of the country, but most in remote and unfrequented places; from whence in Autumn, after a vast increase, they assemble together, and come amongst the Inhabitants in such numbers that they sometimes darken the air, and are seen in continued flights for miles together, making great devastation of grain [rice] where they light." The Florida Grackle belongs strictly to the region near or adjacent to the coast, but always avoiding salt water; its nest is invariably built in trees or in low bushes over water, but never in woodpecker holes or in natural cavities of trees. The Florida Grackle therefore becomes the type of the genus with the type locality fixed as the coast of South Carolina, and I suggest the name of Carolina Grackle for the species.

This will leave the Purple Grackle without a name, the earliest available one seems to be versicolor Vieillot, Nouv. Dict. d'Hist. Nat., XXVIII, 1819, 488 (North America). The name of the Purple Grackle will therefore be Quiscalus quiscula versicolor Vieillot, and the Carolina (i. e. Florida) Grackle, Quiscalus quiscula quiscula Linnæus.

Passerculus princeps. IPSWICH SPARROW.—I made three trips to Long Island (Isle of Palms) in the autumn and winter of 1917 and each trip represented a walk of fifteen miles over low sand hills. It was not until my last visit on December 28 that I was able to detect even one of these birds which was secured after a long chase. This bird, although a young male of the year, has the superciliary stripe marked somewhat

strongly with canary yellow. It was also undergoing a moult embracing the head, jugulum and upper breast feathers.

Passerherbulus lecontei. Leconte's Sparrow.— In 'Birds of South Carolina,' 1910, page 120, I expressed my belief that many of these birds remain until April. During the past winter of 1917–1918 Leconte's Sparrows were present in considerable numbers. As usual fires were of a daily occurrence on account chiefly of a long protracted drought so that fields of broom grass, as well as dense forests, were completely burned over. I, however, succeeded in saving a field of broom grass near my home, which embraced about ten acres, from the flames. In this field I procured specimens in March and April as follows: March 22, one; April 4, one; April 17, one undergoing a spring moult was taken; April 27, one in very worn plumage was secured. Of the series of thirty-one birds taken only five were males, which was the case in the winter of 1893–94, when the birds were here in great numbers, showing that the males remain farther north.

Lanivireo solitarius alticola. Mountain Solitary Vireo.— On January 11, 1912, I secured a perfectly typical example of this large race near Mount Pleasant. The specimen is an adult male and the taking of it in January shows that a few sporadic individuals must winter regularly here.

Vermivora bachmani. Bachman's Warbler.— I found on March 28, 1918, on the extreme northeastern edge of I'On Swamp, near Witherwood plantation, a nest containing five eggs of the rare Bachman's Warbler. These eggs were incubated for at least five or even seven days and show that, although this bird does not winter, it arrives very early in the spring and breeds even much earlier than the resident Pine Warbler (Dendroica vigorsii) and Yellow-throated Warbler (Dendroica dominica).

Dendroica magnolia. Magnolia Warbler.— On October 10, 1915, I shot a young male of this species about 300 yards of the spot where the first one for the coast region was taken on September 29, 1912, and recorded by me in 'The Auk,' XXX, 1913, 277. It is evident that the Magnolia Warbler migrates in small numbers along the coast of South Carolina, in the autumn.

Dendroica virens. Black-throated Green Warbler.— The brief account of this bird written in 'Birds of South Carolina' is, in the main, correct. Although I had never found it breeding when the book went to the press I was absolutely certain that it really bred on the coast in widely separated places due to the presence of original heavily timbered forests, which is requisite for the birds in the breeding season. And the reason for not stating that the birds breed here was that I respected the opinion of other persons whose views did not coincide with mine. On April 11, 1917, however, I found a female building a nest in a tall pine tree in I'On Swamp, and on April 25, 1918, I saw another female carrying nesting materials, but could not locate the place by following her, as the swamp was too dense. According to Mr. Loomis the birds breed in the mountains of Pickens County and also at Cæsar's Head, Greenville County

(see Auk, VII, 1890, 128, and VIII, 1891, 331). As far as I am aware, after searching the literature on the breeding range, there is no breeding maritime record south of Long Island, New York, which is nearly 600 miles northeast of the region where the birds breed on the South Carolina coast. This is indeed truly remarkable.

Oporornis agilis. Connecticut Warbler.— Misses Louise Petigru Ford and Marion J. Pellew saw at Aiken on May 12, 1915, an adult male on the ground among highland ferns. These ladies watched this bird for a long time through powerful opera glasses and no mistake whatever was made by them, as they are familiar with the resident as well as migratory birds found about Aiken. The Connecticut Warbler is very rare in the spring east of the Alleghenies. Mr. Loomis took one at Chester on May 10, 1889, but I have yet to take one in South Carolina.

# LIST OF BIRDS COLLECTED ON THE HARVARD PERUVIAN EXPEDITION OF 1916.

BY OUTRAM BANGS AND G. K. NOBLE.

The birds listed in the following notes were collected by one of us — Noble who accompanied as naturalist the Harvard Peruvian Expedition of 1916.

This was a short summer vacation trip, financed by friends of the Museum of Comparative Zoölogy, into the northwestern corner of Peru. Roughly speaking the expedition covered a triangular course from Payta to Tabaconas and thence out to the coast again at Chiclayo. The regions traveled were mostly desert or semi-desert ones; at a few places only was real sub-tropical forest met with.

A careful itinerary by Noble will be published later with his account of the Reptiles and Batrachians, upon which he was working when he answered the call to the service of his country in war.

For the loan of, often very necessary, specimens we are much indebted to Dr. Chas. W. Richmond of the United States National Museum, Dr. Frank M. Chapman of the American Museum of

Natural History, Mr. W. E. Clyde Todd of the Carnegie Museum, Mr. Chas. B. Cory of the Field Museum of Natural History and Mr. T. E. Penard of Arlington, Mass.

# Phalacrocoracidæ.

Phalacrocorax vigua vigua (Vieill.). One Q, Perico, September 14.

#### Falconidæ.

Polyborus cheriway cheriway (Jacq.). One adult Q, Perico, September 14.

This specimen agrees, with two others — one from Punto Caiman, Santa Marta, Colombia, one from Rio Caura, Venezuela — kindly let us by W. E. Clyde Todd of the Carnegie Museum. The bird of northern South America, as shown by the three skins now before us, two of which are fine adults, is clearly different from the North American Caracara.

The South American form is much more intensely black, less brownish black, is slightly smaller throughout and has a shorter, and more feeble bill.

We would therefore suggest the large, heavy-billed, brownish black North American bird, be known as

# Polyborus cheriway auduboni Cassin,

based upon Audubon's Florida specimen, which Audubon presented to the Academy of Natural Sciences of Philadelphia. This form occurs in Cuba, and on the mainland ranges from northern Lower California, Arizona, Texas and Florida south to Panama. Skins from Panama differ but little from those from northern localities, and are decidedly referable to P. cheriway audubonii rather than to P. cheriway cheriway (Jacq.).

The Caracara was observed throughout most of the lowlands. Along the Upper Piura River Valley Caracaras were very abundant. Several were nearly always to be seen in the vicinity of every clearing.

Ibycter megalopterus (Meyen). One adult ♂, Lake Warinja, August 18. This bird was seen only at the highest altitudes visited, the single specimen was secured at about 9000 feet.

Accipiter bicolor bicolor (Vieill.). Five specimens, immature of both sexes, and one adult  $\circ$ , Perico and Bellavista, September.

Chapman, in 'The Distribution of Bird-Life in Colombia,' p. 242, does not recognize a western form of this hawk, A. b. schistochlamys Hellmayr, and the series of twelve skins in the Museum of Comparative Zoölogy wholly supports what he has said.

The present specimens agree in color with skins from Panama and Costa Rica and even with those from so far north as Quintana Roo. There is, however, a gradual increase in size northward and examples from Vera Cruz — practically, the northern limit of the species,— are very large. The one adult female we possess from this State is besides much darker in

color than any from farther south, and for this large dark northern form, we propose the name —

# Accipiter bicolor fidens subsp. nov.

Type from Buena Vista, Vera Cruz, Mexico, fully adult 9, No. 2289 Bangs Coll. (in Museum of Comparative Zoölogy). Collected June 14, 1901, by A. E. Colburn and P. W. Shufeldt.

Characters. Larger and darker than A. b. bicolor (Vieill.), upper parts blackish slate, under parts slate gray. Type  $\circ$  ad., wing, 260; tail, 209, tarsus, 67; culmen from cere, 20.5. Topotype, No. 2290,  $\circ$  immature, wing, 255; tail, 212; tarsus, 68; culmen from cere, 18.

Only one of the five specimens in the series contained food in its crop. This consisted of five or six large cockroaches.

Heterospizias meridionalis (Lath.). One young (♂?) with the under tail coverts still in down, Perico, September 16.

Rupornis magnirostris occidua Bangs. Ten specimens, one immature 9, and adults of both sexes. Bellavista and Perico, September.

These skins are very uniform in character and agree exactly with the type. Compared with a fine series of true *R. magnirostris* from Paramaribo, Surinam, kindly lent us by T. E. Penard, they are very different.

By far the commonest hawk met with throughout the Valley of the Marañon and Chenchipe was this species, but the bird was not seen to the west of the Andean range.

The crops and stomachs of the ten specimens collected contained the following variety of food:

- 4. Burrowing Snakes (Glauconia).
- 1. Burrowing Lizard (Bachia).
- 2. Mice.
- 1. Chilopod.
- Grasshopper.

## Herpetotheres cachinnans maestus subsp. nov.

Two females, one immature, one adult Bellavista and Perico, September. Type from Bellavista, Peru, adult 9 No. 80152 M. C. Z. Collected September 19, 1916, by G. K. Noble.

Characters. Size small, and under wing coverts heavily spotted as in *H. cachinnans fulvescens* Chapman of western Colombia, but with the under parts very much whiter—buffy white. Similar also to *H. c. cachinnans* (Linn.) of Guiana, but smaller; the under wing coverts more heavily spotted, and the underparts paler—whiter.

# Measurements.

No.	Sex.	Locality.	Wing.	Tail.	Tarsus.	Culmen from Cere.
80152	♀ ad.	Bellavista	235.	185.	67.	21.
80151	♀ imm.	Perico	229.	169.	69.	23.

All of the Crying Falcons observed were found in the immediate vicinity of the river beds. They were very fond of remaining perched throughout most of the day upon some tall tree which commanded a wide stretch of the river valley.

One of the specimens collected contained in its crop a large Chilopod, Scolopendra gigantea (Linné) and the legs of a lizard (either Stenocercus or Liocephalus).

Chondrohierax uncinatus megarhynchus (Des Murs). Two adults, of and Q, Bellavista, September 24.

Our specimens have larger bills than any in a considerable series of skins from eastern South America, still they fall somewhat short of the maximum measurements given for true megarhynchus and are probably intermediate between that form and uncinatus. They afford the following measurements.

No.	Sex.	Wing.	Tail.	Tarsus.	Culmen from Cere.
80153	o ad.	282	188	36.	34.
80154	Q ad.	303	211	38.5	35.

Probably a breeding pair taken together in a wood near the banks of the Marañon. The gonads were well developed in both.

Falco deiroleucus Temm. One adult 9, Perico, September 7. This bird is one of a pair that had a nest on a high tree upon which she was perched when shot. The tree was near the border of a vast stretch of tropical arid lands.

Cerchneis sparverius caucæ Chapman. One adult ♂, Sullana, August 1. Only seen in the dry coastal deserts, where it was decidedly uncommon.

#### Tinamidæ.

Crypturellus tataupa inops subsp. nov. Three adult males, Bellavista and Perico, September.

Type from Perico, northwestern Peru, adult ♂, No. 80123 M. C. Z. Collected September 10, 1916, by G. K. Noble.

Characters. Similar to true C. tataupa (Temm.) of Brazil, but under parts paler and more whitish, middle of breast and belly pale grayish white (brownish gray in true tataupa); upper parts browner—less vinaceous or reddish brown, but not darker. Similar also to C. t. peruviana Cory of San Ramon, west central Peru, but much paler throughout, the under parts much more whitish and the upper parts much less vinaceous brown (C. peruviana is a darker bird than C. tataupa), and wing shorter.

<sup>&</sup>lt;sup>1</sup> For change from *Leplodon* to *Chondrohierax* see Chubb, The Birds of British Guiana, Vol. I, p. 267, 1916.

# Measurements.

No.	Sex.	Locality.	Wing.	Tarsus.	Culmen.
80123	or ad.	Perico	117.	32.5	21.5
80124	or ad.	Bellavista	118.	34.	22.
80125	of ad.	44	119.	35.	22.

Found only in the grassy uplands.

## Rallidæ

Pardirallus rytirhynchus rytirhynchus (Vieill.). One adult  $\sigma$ , Huancabamba, August 22.

The only specimen secured was taken near the Plaza of the little village of Sondor, a suburb or outlying town of Huancabamba. A number of rails, probably all referable to this species were observed in the meadows of an affluent of the Huancabamba River, but none of these could be secured. A little later a pair of rails were seen feeding with some of the village chickens in a slough near the plaza. One of these was singled out from the chickens and shot.

## Charadriidæ.

Ptiloscelys resplendens (Tschudi). Three adults, one male, two females, Lake Warinja, August 18. At this point the plover was abundant, but was seen at none of the many other high lakes visited.

## Scolapacidæ.

Actitis macularia (Linn.). One adult of Huancabamba, August 27. Seen now and then along the stony bed of the Huancabamba River throughout the month of August.

## Columbidæ.

Chlorenas cenops (Salvin). One adult Q, Perico, September 11. Apparently rare in northwestern Peru, as only one or two small flocks were seen. These frequented the banks of a deep river valley, and were very shy.

# Zenaida auriculata pallens subsp. nov.

Four adults, both sexes, Sullana and Huancabamba, August.

Type from Huancabamba, northwestern Peru, adult ♂, No. 80019 M. C. Z. Collected August 22, 1916, by G. K. Noble.

Characters, similar to Z. auriculata auriculata (Des Murs) but upper parts slightly paler and grayer; under parts much paler, the vinaceous of neck and chest much lighter and more pinkish; lower breast, belly, sides and under tail coverts pale pinkish buff — almost whitish.

Measurements. Type adult ♂, wing, 148; tail, 98; tarsus, 23; exposed culmen, 19. Topotype adult ♀, No. 80022, wing, 143; tail, 95; tarsus, 20; exposed culmen, 16.

Remarks. This very pale form was a common bird along the streams that cross the coastal deserts. No specimen among the numbers we have examined from various parts of South America approach our birds in the general pallor of the under parts, and the form appears to be a well marked subspecies.

There is some probability that the type of Zenaida hypoleuca Bp. collected by Capt. Kellett and Lieut. Wood, now in the British Museum, did not really come from the Pearl Islands, but we hardly believe even so that it represents the local desert form we have just named.

Eupelia cruziana (Prev. & Knip.). Five adults, both sexes, Huanca-bamba, August.

A common bird in the cultivated lands about Huancabamba, but not observed elsewhere.

Leptotila decolor Salvin. Eight specimens, one immature ♀ and adults of both sexes, Bellavista and Huancabamba, August and September.

Frequently met with throughout the whole region traversed, except at the higher altitudes.

## Psittacidæ.

Ara militaris militaris (Linn.). Four adults, both sexes, Bellavista, September.

Scattered flocks of these Aras passed each morning and evening up or down the Marañon. The birds chattered to each other as they flew. Their call was deep, and not unpleasant, very different from the raucous crys of most parrots. The flocks generally consisted of three or four individuals. Never more than seven birds were seen in a single flock.

Aratinga rubrolarvatus Massena et Sauancé. One immature  $\varphi$ , Sullana, July 29. This skin has no red whatever on the head or the bend of the wing; the small under wing-coverts are however, mostly red. It resembles immature examples of A. finschi (Salv.), but is darker, less yellowish green, with the under surface of the wing darker, more olive, less yellowish, and has a much larger bill.

This Paroquet is very abundant along the river valleys which cross the coastal deserts. Flocks of several thousand individuals were often seen flying up the Chira River during the early evening.

Aratinga frontatus Cab. Seven adults, both sexes, Perico and Tabaconas, September.

A bird of the subtropical arid lands and the arid valleys of the Chinchipe and Marañon. It entirely replaces A. rubrolarvatus in the hills, and eastern river valleys where it is common in the thickets of acacias and cacti.

Psittacula cœlestis cœlestis (Less.). Fourteen specimens, immature and adults of both sexes, Huancabamba, August.

Although this species was found most abundantly at Huancabamba it was also observed in the humid subtropical region of Tabaconas, and the dry valley of the Marañon.

**Pionus corallinus** Bp. One adult ♂, Perico, September 14. This was the only individual seen, it was shot in the dense woods which fill the river valley at this point.

## Cuculidæ.

Piaya cayana nigricrissa Scl. Eight adults, both sexes, Perico and Bellavista, September.

Abundant in the humid subtropical region as well as the dry tropical zone of the eastern Andean range. Several specimens were observed at Tabaconas.

Tapera nævia nævia (Linn.). One Q, Perico, September 16.

## Bubonidæ.

# Otus roboratus sp. nov.

Two adult males, Perico and Bellavista, September.

Type from Bellavista, Peru, adult &, No. 80073 M. C. Z. Collected September 25, 1916, by G. K. Noble.

Characters. Unlike any south American form; in color somewhat similar to O. cassini (Ridg.) of Vera Cruz, Mexico, but considerably larger; toes perfectly naked; tarsus densely feathered.

Color. Both skins in brown phase. Pileum brownish black, the feathers with small lateral spots of paler brown; a broad whitish nuchal collar, the feathers of which are somewhat banded with dusky; ear-tufts mixed grayish white and warm brown; general color of upper parts grayish brown, somewhat barred or marked with dusky, and with some paler or browner irregular spots; outer webs of outer scapulars chiefly buffy white; outer webs of middle wing coverts also chiefly buffy white; alula notched and spotted with buffy white towards tips on outer webs and with cinnamon basally and on inner webs; primaries with large spots of buffy white on outer webs; inner webs dusky, with broad bands of cinnamon brown; tail grayish brown, with narrow bands of cinnamon brown, and freckled with dusky; face grayish white, browner on ear coverts, narrowly barred with dusky; under surface white, the feathers of breast, chest and sides with mesial streaks and narrow irregular cross bars of black, heaviest on chest and here bordered with warm brown; middle of belly clear white; legs buffy white, slightly vermiculated with brownish; under tail coverts white faintly vermiculated with dusky.

# Measurements.

No.		Sex.	Wing.	Tail.	Tarsus	from Cere.
80073	Bellavista	o <sup>n</sup>	168.	82.	39.	14.
80072	Perico	o <sup>n</sup>	164.	87.	36.	14.

Remarks. Undoubtedly this is the Scops Owl, recorded by Salvadori and Festa (Boll. Mus. Zool. Torino. XV, p. 33, 1900) from Vinces, western Ecuador, and referred by them with much doubt to Scops guatemalæ Sharpe.

Our specimens are easily told from O. guatemalæ or O. vermiculatus (Ridg.), but strangely enough are very like the more northern and very local O. cassini in color. Their much larger size will, however, at once distinguish them.

Pulsatrix perspicillata perspicillata (Lath.). One adult Q, Perico, September 10.

This skin agrees almost exactly with specimens in the collection of T. E. Penard, from the vicinity of Paramaribo, Surinam. The toes are feathered almost to the claws, and it certainly belongs here and not to *P. melanonota* (Tschu.).

Glaucidium jardinii (Bp.). Three adults, one male, two females, Perico, September.

All of the Pygmy Owls secured were taken during the daytime in the thick but very dry patches of wood which border the Chinchipe at various points.

Spectyto cunicularia punensis Chapman. Five adults, both sexes, Sullana, August.

This strikingly pale form was lately described from Puna Island; our record slightly extends its range southward.

The five specimens were all collected at one colony. This colony of about two dozen burrows was situated on the gentle slope of a sandy hill which overlooked the green valley of the Chira River near Sullana.

## Tytonidæ.

Tyto alba contempta (Hartert). Two adults, ♂ and ♀, Bellavistal and Chongollapi, September and October.

# Nyctibiidæ.

Nyctibius griseus cornutus (Vieill.). One adult ♀, Perico, September 10.

# Caprimulgidæ.

Nyctidromus albicollis albicollis (Gml.). Five adults, both sexes, Perico, Bellavista, Tabaconas and Huancabamba, August and September.

These skins agree well enough with typical albicollis to be referred to that form. Mr. Cory has kindly compared them with his N. albicollis obscurus from Yurimaguas, Peru, and tells us that our bird has nothing to do with that dark colored subspecies.

Very abundant in all of the zones except the coastal desert. Several of the birds collected were induced to alight in open clearings by imitating their guttural whistle.

## Alcedinidæ.

Chloroceryle americana cabanisi (Tschudi). Three adult females, Bellavista and Huancabamba, August and September.

#### Picidæ.

Hypoxanthus rivolii brevirostris Tacz. One adult ♂, Tabaconas, September 11.

This species was seen on one or two occasions only, always in wooded valleys.

Chrysoptilus atricollis lymani Bangs & Noble. Chrysoptilus atricollis lymani Bangs and Noble, Proceedings of the New England Zoölogical Club, Vol. VI, p. 85–86, June 7, 1918, original description.

\* Six specimens, two immature ( $\sigma$  and  $\circ$ ) and adults of both sexes, Huancabamba, August.

Veniliornis callonotus major (Berl. & Stolz.). Two adult females, Sullana and Bellavista, July and September.

Veniliornis agilis (Cab. & Hein.). One adult ♂, Bellavista, September 29.

Ceophlœus lineatus lineatus (Linn.). Two adults,  $\sigma^i$  and  $\circ$ , Perico, September.

Scapaneus melanoleucus (Gml.). One adult Q, Perico, September 15.

Picumnus lafresnayei Malh. One adult, (9), Bellavista, September 24.

## Trogonidæ.

**Pharomachrus auriceps** (Gould). One adult  $\circ$ , Tabaconas, August 19. This specimen is in no way smaller than Colombian skins, and we therefore do not refer it to *P. auriceps heliactin* (Cabs. and Hein.) which on geographical grounds it should represent.

Observed only in the humid subtropical forest of Tabaconas.

Trogonurus collaris (Vieill.). Three specimens, an immature 2 and adult  $\sigma$  and  $\varphi$ , Perico and Charapi, September.

Frequently noted in the subtropical forests between Tabaconas and the Chinchipe Valley.

### Trochilidæ.

# Thaumasius taczanowskii fractus subsp. nov.

Four adult males, Huancabamba, August.

Type from Huancabamba, northwestern Peru, adult ♂, No. 80118 M. C. Z. Collected August 9, 1916, by G. K. Noble.

Characters. Similar to true T. taczanowskii (Sclater) but upper parts darker and purer green, less mixed with grayish and less coppery; bill much shorter.

# Measurements.

No.	Sex.	Wing.	Tail.	Exposed culmen.
80115	o ad.	69.	38.	21.5
80116	o ad.	69.5	39.	22.
80117	o ad.	70.	40.5	21.5
80118	o ad.	68.	• 39.	22.

Remarks. We have made our comparison with skins of true T. tac-zanowskii collected by O. T. Baron at Malea Cajabamba, 8000 feet altitude, and Otusco, 4000 feet altitude, Peru, received in exchange, some years ago from the late Count Von Berlepsch. These agree almost exactly with the measurements and description of the type series.

By far the commonest hummingbird about Huancabamba was this species. It was observed very often in the shrubbery along the roadsides.

Patagona gigas peruviana Boucard. Three adults, two males and a female, Huancabamba, August.

Ocreatus cissiurus cissiurus Gould. One adult male, Perico, September 9.

Adelomyia melanogenys maculata Gould. One adult male, Tabaconas, September 2. This specimen appears to belong to this form rather than to *chlorospila* Gould of more southern Peru. Compared with skins from Ecuador, our one specimen is paler below and if others should prove to be the same, it represents a pale unnamed race.

Psalidoprymna gouldi chlorura (Gould). One adult male, Tabaconas, August 29.

## Conopophagidæ.

Conopophaga peruviana Des Murs. One adult female, Perico, September 12. With but a single female we are not sure this identification is correct, possibly our bird is the female of *C. castaneiceps* Scl.

## Formicariidæ.

Taraba melanura debilis Berl. & Stolz. Three specimens, an immature male and adult male and female, Bellavista, September.

Apparently our specimens belong to this form, described from Central Peru, agreeing much better in size and proportions with it than with true T. melanura (Gould) of Ecuador.

Thamnophilus radiatus variegaticeps Berl. & Stolz. One adult or, Bellavista, September 29. Our skin agrees fairly well with the description of this form from Central Peru.

Erionotus albiventris (Tacz.). Seven specimens, an immature male and adults of both sexes, Perico, September.

This is apparently a very distinct species; the male has a large white belly patch and a pale gray throat, in the female belly and throat both are whitish.

Dysithamnus semicinereus Sclater. One male (not quite adult, still having a little yellow on lower belly), Perico, September 12.

In spite of Todd's recent review of the group of Ant Thrushes to which this bird belongs, there is still much doubt as to the number of forms that should be recognized. Chapman in his Distribution of Bird Life in Colombia, p. 370, says that the small race from the Pacific Coast of Ecuador and another from the western slope of the Central Andes in Colombia, are both good and as yet unnamed.

Our bird is not large, like Peruvian examples from the general region whence came the type of *D. tambillanus* Tacz. nor is it small as are west Ecuador skins, but affords the following measurements: wing, 66; tail, 41; tarsus, 20; culmen, 15, which are about those of Colombian specimens.

Hapalocercus meloryphus fulviceps (Scl.). One adult 9, Perico, September 11.

Ridgway considers that *Hapalocercus* belongs in the Formicariidæ and we follow him in this disposition of the genus.

Grallaria albiloris Tacz. One adult female, Tabaconas, September 2. The only representative of the genus observed throughout the entire trip was the specimen collected. It was found while scratching among the wet mosses of the forest floor near Tabaconas.

## Furnariidæ.

Geositta peruviana paytæ Ménégaux and Hellmayr. Five adults, Paita, July.

These are topotypes. Whether or not this much paler bird should stand as a species, as the original describers considered it, or as a subspecies of *G. peruviana* Lafr., is of course a matter of opinion.

The Miner was the commonest bird about Paita. Flocks of them were

nearly always to be seen on the sandy hills surrounding the town, but the bird was not noted at all a few miles inland.

Furnarius cinnamomeus (Less.). Seven adults, both sexes, Huancabamba and Sullana, July and August.

The Oven-bird was often seen about the towns of Huancabamba and Sullana but in the sparsely inhabited interior it was not met with at all.

Synallaxis maranonica Tacz. Four adults, both sexes, Bellavista, September.

Synallaxis stictothorax Scl. Four adults, both sexes, Bellavista and Perico, September.

Siptornis cisandina (Tacz.)? Three specimens, two immature females and one adult male, Huancabamba, August.

We have compared our birds with a series of skins in the American Museum of S. antisiensis Scl. from which they differ in having the superciliary stripe grayish white (quits fulvous in S. antisiensis) and the ear coverts much grayer less fulvous or rusty. We have seen no specimens of S. cisandina and refer our birds to that form with some doubt. If they do represent it, it certainly is only subspecifically to be separated from antisiensis.

Phacellodomus rufifrons (Wied.). Sixteen specimens, both sexes, apparently all adult, Bellavista and Perico, September.

# Dendrocolaptidæ.

**Picolaptes warscewiczi** (Cab. & Heine). Two adults,  $\sigma$  and  $\varphi$ , Tabaconas, August 29 and September 1.

# Cotingidæ.

Heliochera rufaxilla (Tschudi). One adult & Tabaconas, September 3

The single specimen collected was the only one observed. It was found singing on the top of a tall tree in the subtropical forests of the Tabaconas River Valley.

Cephalopterus ornatus Geoff. Two adults, male and female, from the woods northeast of Perico, September 16.

## Pipridæ.

Pipra erythrocephala berlepschi Ridg. Three adult males, Perico, September.

# Tyrannidæ.

Myiotheretes striaticollis (Scl.). One adult female, Huancabamba, August 22.

Serpophaga cinerea cana Bangs. Three adults, one male, two females, Huancabamba, August.

These specimens may be somewhat intermediate, but are nearer to cana than to the southern form, true S. cinerea (Strick.).

This little Flycatcher was seen only along the torrents of the central Andes. It runs nimbly over the rocks, and on several occasions was seen to pick up tidbits from the surface of the stream.

Tyranniscus uropygialis (Lawr.). One adult female, Tabaconas, September 1.

We have compared this skin with the type of Lawrence's Mecocerculus uropygialis kindly lent us for the purpose by the authorities of the American Museum of Natural History. The two specimens are very similar. Lawrence supposed his type came from Ecuador. It is a little larger than our bird, but if it is a male — ours is a female — sexual difference in size would just about account for the difference exhibited by the two specimens. The only other point of dissimilarity is that the back in the type is dull reddish olive whereas the back in our bird is olive. This difference is in all probability due to actual fading in the older specimen, such as so often occurs with olive in many species of birds.

The species is certainly not a *Mecocerculus*, but so far as we can see is a *Tyranniscus*.

The two skins afford the following measurements:

					Exposed
No.		Wing.	Tail.	Tarsus.	culmen.
42421 1	Type	62	49.	16.5	7.
79910 2	0	58	45	16.5	7

Camptostoma sclateri (Berl. & Tacz.) Three adults, one male, two females, Huancabamba, August and September.

Phæomyias murina tumbezana (Tacz.). Two adults, male and female, Perico and Bellavista, September.

Elænia leucospodia Tacz. One adult female, Sullana, July 29.

Mylozetetes similis connivens Berl. & Stolzm. Five adults, both sexes, Bellavista and Perico, September.

Our series bears out all characters claimed for the subspecies by its authors, and besides our birds average smaller with slightly smaller bills, than numerous examples from Bahia.

Mionectes striaticollis poliocephalus Tacz. One adult male, Tabaconas, September 1.

Leptopogon superciliaris poliocephalus Cab. & Heine. One adult female, Perico, September 12.

This specimen obviously belongs with the northern race, and is not different from birds from western Colombia.

Hellmayr, P. Z. S. 1911, p. 1132 has pointed out that the Central American bird must be referred to poliocephalus unless it represents still

<sup>&</sup>lt;sup>1</sup> American Museum of Natural History.

<sup>&</sup>lt;sup>2</sup> Museum of Comparative Zoölogy.

another race. In this connection we have carefully compared ten adults from Costa Rica with five from Colombia and can find no way in which they differ.

Our Perico female is not at all small, in all measurements being similar to females from Colombia and Costa Rica, and we believe the subspecies transardinus Berl. and Stolz. cannot be maintained. This was Hellmayr's opinion, also.

Pyrocephalus rubineus heterurus Berl. & Stolz. Eight specimens, one immature male and adults of both sexes, Paita, Sullana, Huancabamba, and Bellavista, July, August and September.

A very conspicuous and abundant bird in all of the lowlands.

Empidochanes pœcilurus peruanus Berl. & Stolzm. Two adults, ♂ and ♀, Charapi and Perico, September.

Myiobius villosus Scl. One adult female, Perico, September 12.

Myiobius cinnamomeus cinnamomeus (d'Orb. & Lafr.). One adult female, Tabaconas, August 29.

Myiochanes fumigatus ardesiacus (Lafr.). Two adult males, Tabaconas, August 29 and September 2.

Myiochanes punensis (Lawr.). Three adults, two males and a female, Huancabamba, August.

Myiophobus fasciatus saturatus Berl. & Stolzm. Three specimens, one immature female, and adult male and female, Huancabamba, August.

Sayornis nigricans angustirostris Berl. & Stolzm. One adult male, Perico, September 13.

Our skin agrees in all color characters with Berlepsch and Stolzmann's description of the central Peruvian form. Its bill, however, is not smaller than is usual in examples of S. n. cineracea (Lafr.) from Venezuela and eastern Colombia. Berlepsch and Stolzmann in one of their papers (Ornis, Vol. XIII, p. 85) speak of a specimen with a larger bill than the type, and in another article refer a bird with a small bill from Ecuador to this form. The size of the bill would therefore seem to be somewhat variable, and we have little hesitation in allotting our specimen to this subspecies.

Myiarchus tyrannulus chlorepiscius Berl. & Leverkühn. Two adult males, Bellavista, September.

Myiarchus ferox phæocephalus Scl. Four adults, both sexes, Bellavista and Perico, September.

Myiarchus cephalotes Tacz. Two adults, male and female, Tabaconas, September.

Myiarchus atriceps Cab. Two adults, male and female, Tabaconas, September.

Myiarchus semirufus Scl. One adult female, Sullana, July 30.

Tyrannus melancholicus melancholicus Vieill. Six adults, both sexes, Tabaconas, Huancabamba, and Bellavista, August and September. It was a rare exception to find a bird in several life zones. Nevertheless

this species was observed everywhere but in the high mountains and along the coastal deserts.

## Mimidæ.

Mimus longicaudatus punensis Hellmayr. Four adults, both sexes, Sullana, July.

Although the Mockingbird was perhaps the most characteristic bird of the coastal deserts it was not seen at all in any of the deserts of the interior. At Sullana it was observed to feed on lizards (Tropidurus).

#### Turdidm.

Turdus reevei Lawr. Three adults, one male, two females, Huanca-bamba, August.

Turdus maculirostris Berl.? One immature female, Huancabamba, August 17.

Apparently our bird belongs here, having but one immature specimen makes our identification not positive.

Turdus gigas gigantodes Cab. Two specimens, male and female, both immature, Huancabamba, August.

A very common species in all the highlands.

Turdus chiguanco conradi Salv. & Festa. Seven specimens, one immature o, and adults of both sexes, Huancabamba, August.

The most abundant thrush in the central Andes of northern Peru.

Turdus maranonicus Tacz. Seven adults, both sexes, Tabaconas, Perico, Bellavista, Charapi and Huancabamba, August and September.

Unlike the two above mentioned species this thrush was found only in the trees or bushes. It was never seen in the open, feeding on the ground, like the other species.

## Polioptilidæ.

Polioptila anteocularis maior Hellm. Two adult males, Huancabamba, August.

Polioptila bilineata bilineata (Bp.). Two specimens, male and female adult, Sullana, July 29.

These clearly are referable to the typical form and not to P. b. andina Hellmayr of the Cajabamba region of northern Peru.

#### Troglodytidæ.

Heleodytes balteatus (Baird). Two adults, male and female, Sullana, July.

The Cactus Wrens were perhaps the noisiest of the small birds found about Sullana. They were always fighting and their scolding note is very unpleasant. This cry is a raucous, gurgling sound emitted at short inter-

vals and with great force. The sound is very rhythmic and often so prolonged that it becomes exceedingly monotonous.

Heleodytes fasciatus (Swainson). Five specimens, one immature male and adults of both sexes, Huancabamba, August.

The young bird differs from the adult in having the whole crown uniform dark brown, and in having a conspicuous superciliary stripe.

This form in spite of its decidedly darker coloration is possibly only subspecifically distinct from the former. The ranges of the two species are adjacent and apparently do not overlap. The light colored form occurs only in the coastal desert, and is replaced by the dark one at the foothills of the Andes. Both species,—or geographical races—were found abundantly, and their harsh scolding note was often heard, but never in the region east of Tabaconas.

Pheugopedius sclateri (Tacz.). Two adults, male and female, Bellavista, September.

Troglodytes musculus albicans Berl. & Tacz. Four specimens, three adult males and an adult female, Huancabamba and Bellavista, August and September.

We have no hesitation in referring the three males taken at Huancabamba to this west Ecuador form, which they very closely resemble. The one adult female from Bellavista is however, slightly larger and darker in color, and though in somewhat well worn plumage, the obsolete dark barring of the back is more evident. It is, we consider, an intermediate approaching *T. musculus tecellatus* (Lafr. and d'Orb.).

### Corvida.

Cyanocorax mystacalis (Geoffr.). One adult female, Sullana, August

On the western range of the Andes and even along the coast this Jay is fairly abundant, but it is replaced on the other ranges and in the interior by the following species.

Xanthoura yncas yncas (Bodd.). Seven specimens, one immature male and adults of both sexes, Tabaconas, August and September.

An adult male No. 79885 has a queer asymmetrical tail, which made him very conspicuous in life, as he hopped about in the scrub, occasionally spreading it. The three outer rectrices, normally yellow, on the left hand side are pinkish salmon color (varying on the different feathers or parts of the feathers from Orange Pink and Light Salmon Orange to Salmon Color, of Ridgway). A few of the under tail coverts and some feathers on the flank on the left side, are also of this pink color.

#### Vireonidæ.

Vireosylva chivi griseibarbatus Berl. & Tacz. Four adults, both sexes, Bellavista and Perico, September.

Vireosylva josephæ josephæ (Scl.). Two adult males, Tabaconas, August.

Cyclarhis virenticeps Scl. One adult female, Tabaconas, September 4.

This bird was shot in a heavily wooded region, strongly Ecuadorean in its fauna (especially shown by the reptiles and amphibians), one of the very few really forested areas through which the expedition passed.

Cyclarhis coutrerasi Tacz. Three specimens, one immature and two adult females, Perico and Huancabamba, August and September.

All three were taken in open, sandy country.

The immature bird has the crown mixed ferruginous and green and gray; a ferruginous band surrounding the occiput and passing through the eye on each side to the front, which is also ferruginous.

Both adults are extreme of this form; the bird from Tabaconas is an extreme of *C. virenticeps* and we are therefore forced to regard these two forms as distinct species.

#### Hirundinidæ.

Stelgidopteryx ruficollis uropygialis (Lawr.). One adult male, Bellavista, September 24.

Pygochelidon cyanoleuca (Vieill.). Six specimens, three immature, three adult, both sexes, Huancabamba, Perico and Charapi, August and September.

The adults have completed or nearly completed the postnuptual moult, and are greenish steel blue above. In examining a large series from Costa Rica we find autumnal specimens constantly more greenish, steel blue less violaceous than spring killed examples. Peruvian birds agree exactly, so far as we can see, with the Costa Rican ones. On the other hand all skins from eastern Brazil to the Santa Marta region of Colombia, regardless of seasonal differences, are much more truly violaceous above, and while the difference is slight it appears to be constant and it may still be found expedient to use the name P. cyanoleuca montana (Baird) for the northern and western form.

#### Mniotiltidæ.

Myioborus verticalis verticalis (d'Orb. & Lafr.). Six adults, both sexes, Tabaconas and Huancabamba, August.

### Cœrebidæ.

Diglossopis cærulescens pallida Berl. & Stolzm. One adult (sex not determined), Tabaconas, September 3.

This example is wholly referable to the southern form, agreeing perfectly with a skin collected by O. T. Baron at Leimabumba, which had been determined by the late Count Von Berlepsch.

Dacnis cayana glaucogularis Berl. & Stolzm. One adult male, Perico, September 12.

Cœreba magnirostris (Tacz.). Six adult males, Huancabamba, Perico and Bellavista, August and September.

This is a very distinct form, its enormous bill (exposed culmen 16-18 mm.), grayish back and large white speculum at once separating it. Berlepsch and Stolzmann P. Z. S., March 3, 1896, p. 337, have suggested that perhaps C. perwiana (Cab.) is an earlier name for the species. After carefully reading Cabanis's original description we can see no way of ever being certain what his bird, based, he himself says, on an imperfect specimen, really was, and prefer for the present, anyway, to use Taczanowski's appropriate name.

### Icteridæ.

Ostinops alfredi alfredi (Des Murs). Ten adults, both sexes, Perico and Bellavista, September.

Molothrus bonariensis occidentalis Berl. & Stolz. Seven adults, both sexes, Sullana, July and August.

Only seen on the coastal deserts where it occurs in large flocks.

Icterus mesomelas taczanowskii Ridg. Three adult males, Perico and Bellavista, September.

Some of the natives at Sullana kept this Oriole as a cage bird. It is probable that they captured the bird in the immediate vicinity, although the expedition did not meet with it there.

Trupialis bellicosa (De Filippi). Eight adult males, Huancabamba, August.

Inhabits the grassy interandean valleys, never observed in the lowlands.

#### Tanagridæ.

Tanagra taczanowskii (Scl.). Nine adults, both sexes, Perico and Bellavista, September.

Tanagra xanthogaster quitensis Nelson. One adult male, woods west of Perico, September 11.

Compsocoma sumptuosa sumptuosa (Lesson). Two adults, male and female, Charapi, September 6.

Tangara chilensis (Vig.). Four adult males, Charapi, September.

Tangara pulchra pulchra (Tsch.). One adult male, Charapi, September 12.

Tangara gyroloides catharinæ Hellmayr. Two adults, male and female, Charapi, September 11.

## Tangara parzudakii florentes subsp. nov.

One adult female, Charapi, September 6.

Type from Charapi, northwestern Peru, adult  $\, \circ$ , No. 79675, M. C. Z. Collected, September 6, 1916, by G. K. Noble.

Characters. Similar to true T. parzudakii (Lafr.) of Bogotá, but larger, and belly and under tail coverts much paler,—the belly Warm Buff, the under tail coverts pale Ochraceous Tawny. Wing, 87; tail, 57; tarsus, 20.5; exposed culmen, 10 mm.

Remarks. We have compared our bird with the two cotypes of the species and with "Bogotá" skins, and believe, in spite of having but a single specimen, that it represents a well marked race. In "Bogotá" skins, the wing runs from 78 to 81 mm.

Tangara cyaneicollis cæruleocephala (Swains.). Two adults, male and female, Perico and Tabaconas, September.

Tangara venusta (Sclater). Three adults, two males and a female, Charapi, September.

Tangara argentea fulvigula Berl. and Stolz. Four adults, three males and a female, Tabaconas and Huancabamba, August and September.

Thraupis coelestis major (Berl. and Stolz.). Six specimens, one immature female and adults of both sexes, Huancabamba and Tabaconas, August and September.

## Thraupis cana quaesita subsp. nov.

Three adults, two males and a female, Sullana, July.

Type from Sullana, northwestern Peru, adult &, No. 79692, M. C. Z. Collected, July 30, 1916, by G. K. Noble.

Characters. Very similar to true T. cana (Swainson) of Venezuela and northern Colombia, but darker in general coloration, grayish blue of under parts darker and bluer; back slightly darker; lesser and middle wing coverts much darker blue — Dark Diva Blue (Campanula Blue in true T. cana).

#### Measurements.

No.	Sex.	Wing.	Tail.	Tarsus.	Exposed culmen.
79692	o ad.	90.	66.	22.	7.5
79693	o ad.	88.	67.	20.	8.
79694	Q ad.	87.	65.	19.	7.5

Remarks. Our three skins agree exactly among themselves, and cannot be matched in a very large series of true T. cana. The darker and different blue of the wing coverts is the chief character of the new subspecies which occupies the extreme southwestern corner of the range of the species.

The range of this subspecies apparently does not overlap that of *Thraupis calestes major*. This subspecies was found only in the coastal desert and never in the interior as the latter species.

Thraupis darwini læta Berl. and Stolz. Twenty-one specimens, immature and adults of both sexes, Huancabamba, August.

Sporothraupis cyanocephala cyanocephala (d'Orb. and Lafr.). One adult male, Tabaconas, September 2.

Piranga testacea tschudii Berl. and Stolz. Eight specimens, one immature male, three adult (red) males and four females, Tabaconas and Huancabamba, August and September.

On comparing these skins with the large series, including all the forms of testacea (except Piranga hamalea Salv. and Godman of Mt. Roraima which Berlepsch considers specifically distinct) in the Museum of Comparative Zoölogy, it was at once apparent that the form occupying western Colombia needs a name. Of this bird we have nine specimens — six fully adult red males and three females, all collected by Mervyn G. Palmer, and received some few years ago from W. F. H. Rosenberg of London. They come from La Maria, Dagua Valley and San Antonio, Rio Cali. This form is nearer to true P. testacea Scl. and Salv. Nicaragua to Veragua and Chiriqui, than to any of the others, and has been referred to true testacea by Chapman in his 'Distribution of Bird-Life in Colombia,' we however, cannot agree to this and propose to call it

## Piranga testacea desidiosa subsp. nov.

Type from La Maria, Dagua Valley, west Colombia, No. 23477 Bangs Coll. in M. C. Z., adult 3. Collected May 23, 1908, by M. G. Palmer.

Characters. Adult  $\circlearrowleft$ , similar to same sex in P. testacea testacea Sch. & Salv. but more intense and brilliant red, lacking the dull brownish-red chest of true testacea; underparts scarlet red slightly paler and more scarlet on belly and but little shaded on sides and not at all on chest with brownish red; upper parts slightly richer brownish-red. Adult  $\circ$  similar to same sex in P. testacea but yellower, less greenish below.

Hemithraupis guira guira (Linn.). One adult female, Perico, September 11.

Thlypopsis inornata (Tacz.). Six adults, both sexes, Tabaconas, Bellavista and Perico, September.

Ramphocelus carbo connectens Berl. and Stolz. Nine adults, both sexes, Perico and Bellavista, September.

Tachyphonus rufus (Bodd.). Five adults, both sexes, Perico and Bellavista, September.

#### Fringillidæ.

### Spinus ictericus peruanus Berl. Stolz. and Stolzm.

Five specimens, one immature male and adults of both sexes, Bellavista and Huancabamba, August and September. Our specimens are not quite typical of true S. i. peruanus of Central Peru, though probably nearer that form than any of the others. Compared with one or two specimens of peruanus they are brighter yellow below with brighter yellow rumps, thus closely approaching S. i. alleni Ridg. of Matto Grosso, but our birds have grayish not olive-yellow edges of tertials. They differ at once from

S. i. capitalis (Cab.) in being smaller and in having yellow not white femoral region. On the whole we feel content to call them, for the present, peruanus somewhat approaching alleni.

Astragalinus psaltria croceus (Jouy). Four adults, one male, three females, Bellavista, September.

The male and one of the females are extreme of this form, with the maximum amount of white in the tail; the male with the characteristic light yellow underparts. Of the two remaining females, one has very little white, this whitish not pure white, in the tail; the other none. We cannot however, bring ourselves to refer these two to another form -A. p. columbianus (Lafr.).

This was written before the appearance of Chapman's 'Distribution of Bird-Life in Colombia' and we refer to his remarks, p. 564, where the equally puzzling examples from Colombia are discussed at length.

Myiospiza aurifrons (Spix). Three adults, one male, two females, Bellavista, September.

Brachyspiza capensis peruviana (Less.). Eight adults, both sexes, Huancabamba, August.

Phrygilus alaudinus (Kittl.). One adult female, Huancabamba, September 3.

 Phrygilus ocularis Scl. Six specimens, two immature males and adults of both sexes. Huancabamba and Sullana, August.

Coryphospingus cucullatus (Müll.). Two adult males, Bellavista and Perico, September.

Sicalis flaveola (Linn.). Three adult males, Huancabamba, Sullana, and Bellavista, August and September.

Volatinia jacarini splendens (Vieill.). Four specimens, one immature male, and three adult males, Bellavista, September.

These do not appear to differ from Central American examples. One adult male has the under wing coverts and axillars wholly black; the others have some slight admixture of white, but only to the same extent often shown by specimens from the very northern part of the range of the subspecies.

Piezorhina cinerea Lafr. Two adults, male and female, Sullana, July.

Sporophila simplex (Tacz.). One adult male, Bellavista, September 25.

Sporophila gutturalis inconspicua Berl. and Stolzm. One female, Bellavista, September 25.

It is doubtful if the subspecies can with certainty, be told by a single female, and we refer our bird to *inconspicua*, only because the chances seem to favor its being that form.

Catamenia homochroa Scl. Two immature males, Tabaconas, September.

Pheucticus chrysogaster (Less.). Six adults, both sexes, Huancabamba, August. Saltator striatipectus peruvianus Cory. Six adults, both sexes, Huancabamba, August.

Cory's seven specimens, upon which he based this subspecies were from Hda. Limon, 10 miles west of Balsas, northern Peru, and agree almost perfectly with ours. Possibly ours are not quite so dark.

## NOTES ON NORTH AMERICAN BIRDS.

#### VI.

#### BY HARRY C. OBERHOLSER.

The present paper continues the writer's notes on North American birds.<sup>1</sup> In the following pages there are discussed six species and subspecies, belonging to the families Alcedinidæ, Tytonidæ, Certhiidæ, Paridæ, Mniotiltidæ, and Fringillidæ.

# Streptoceryle alcyon caurina (Grinnell).

The western form of Streptoceryle alcyon was originally described by Dr. Joseph Grinnell,<sup>2</sup> from a specimen taken on Montague Island, Prince William Sound, Alaska. Its geographic distribution has been considered to extend in western North America from Alaska to western Mexico. Recently, however, its validity as a race has been questioned,<sup>3</sup> because of the occurrence in British Columbia of specimens similar to eastern birds. A good series of eastern examples, however, compared with Pacific Coast birds, shows that Streptoceryle alcyon caurina is a readily recognizable race. That specimens occur difficult to distinguish does not of course invalidate a subspecies which is based, and properly so, on

<sup>&</sup>lt;sup>1</sup> For previous papers in this series, cf. 'The Auk,' XXXIV, April, 1917, pp. 191-196; XXXIV, July, 1917, pp. 321-329; XXXIV, October, 1917, pp. 465-470; XXXV, January, 1918, pp. 62-65; and XXXV, April, 1918, pp. 185-187.

<sup>&</sup>lt;sup>2</sup> Univ. Calif. Publ. Zool., V, No. 12, March 5, 1910, p. 388, fig. 4.

<sup>&</sup>lt;sup>3</sup> Taverner, Summary Rep. Geol. Surv. Dept. Mines Canada, for 1916 (1917), p. 361.

average characters. It seems worth while also to call attention to the point that the larger general size of *Streptoceryle alcyon caurina* is a better and more reliable character for the identification of specimens than the long wing tip, since the latter is liable to be affected by the makeup of the skin.

## Tyto pratincola (Bonaparte).

Mr. Ridgway has recently 1 placed the American Barn Owl (Tyto pratincola) as a subspecies of the South American Tyto perlata. Comparison, however, of a series of specimens of Tyto pratincola with examples of the European Tyto alba alba and Tyto alba guttata indicates that the North American bird is only subspecifically related to the races of Europe. It differs from Tyto alba alba in its larger size, darker coloration above, and usually more ochraceous suffusion below. The difference in coloration, however, is not strongly marked, and is at once seen to be but average; and Tuto pratincola is in this respect even more like Tyto alba guttata of middle Europe than like Tyto alba alba of the Mediterranean region. The larger size of the American bird is really the only striking character which separates it from the European forms; but even this, on comparison with a sufficient number of specimens, proves to be bridged over by individual variation. In fact, many specimens of South American races which certainly but subspecifically differ from Tyto pratincola are of practically the same size as European birds. There seems, therefore, no alternative but to consider the American Barn Owl a subspecies of the typical European bird, and its name will therefore become Tyto alba pratincola.

## Certhia familiaris americana Bonaparte.

In a comparatively recent publication,<sup>2</sup> Dr. C. E. Hellmayr has treated *Certhia familiaris americana* and all the other American forms of this genus as subspecies of *Certhia brachydactyla* Brehm.

<sup>&</sup>lt;sup>1</sup> Bull. U. S. Nat. Mus., No. 50, part VI, 1914, pp. 601, 602, 605.

<sup>&</sup>lt;sup>2</sup> Wytsman's Genera Avium, XV, 1911, p. 8.

This latter species differs from Certhia familiaris Linnæus principally in its shorter, more curved hind elaw and its longer bill. The color differences assigned by Dr. Hellmayr for these two species do not always correlate with the structural characters. There seems to be some mistake in this allocation of the American forms, since Certhia familiaris americana is very closely allied to Certhia familiaris familiaris of Europe, and, judging by the shape and size of its hind claw and bill, certainly conspecific. All the American forms are well known to be certainly but subspecifically different from Certhia familiaris americana, and, therefore, all should be regarded, as they formerly have been, subspecies of Certhia familiaris familiaris.

## Penthestes carolinensis (Audubon).

In a revision of the Paridæ, published a few years ago,¹ Dr. C. E. Hellmayr relegated Penthestes carolinensis (Audubon) to subspecific rank under Penthestes atricapillus (Linnæus). A close study of these birds in life and in the cabinet indicates that this view of their relationship does not best represent the facts; for, while the characters of plumage and of size separating them are relatively slight, these are likewise relatively constant, and it is possible to identify all normal specimens. Their songs, or rather love notes, are radically different in quality and form and can never be mistaken. Furthermore, wherever their breeding ranges meet or overlap, as they do in places in the eastern United States, particularly in the southern Allegheny Mountains, both birds remain just as distinct in all respects as elsewhere. Hence they should evidently be considered distinct species.

## Dendroica coronata hooveri McGregor.

This race of the Myrtle Warbler was originally described by Mr. R. C. McGregor <sup>2</sup> from a specimen taken at Palo Alto, California. Most subsequent authors, however, with the exception of Dr.

<sup>&</sup>lt;sup>1</sup> Wytsman's Genera Avium, XVIII, 1911, p. 34.

<sup>&</sup>lt;sup>2</sup> Bull. Cooper Orn. Club, I, No. 2, March, 1899, p. 32.

Joseph Grinnell and a few western ornithologists, have refused it recognition, and Mr. J. H. Riley has recently 1 expressed serious doubts regarding its validity. Its failure of recognition has probably been due chiefly to the statement of the original describer, that it differs from Dendroica coronata coronata only in somewhat greater size. Examination of a large series now shows that Dendroica coronata hooveri is a recognizable race and that it differs from Dendroica coronata coronata not only in its larger size but in the coloration of male, female, and even young. The male has less black on the lower parts, that on the jugulum and on the sides of the breast being more broken by white; and the yellow of rump averages paler. The female has the upper parts more grayish (less rufescent brownish) and also the yellow of the rump usually somewhat lighter. Juvenal birds are usually darker, duller, less rufescent brown above than examples of Dendroica coronata coronala in the same stage.

The geographic distribution of *Dendroica coronata hooveri* is as follows: Western North America. Breeds north to northwestern Mackenzie, northern Yukon, and north central Alaska; west to western Alaska; south to southern Alaska, central British Columbia, and central Alberta; and east to eastern Alberta and central Mackenzie. Winters north at least to California, New Mexico, and Texas; south to the state of Vera Cruz in Mexico, and southern Lower California.

# Acanthis hornemanni exilipes (Coues).

Redpolls are among the most difficult of American Fringillidæ. The relationships of the forms of the genus Acanthis were for many years imperfectly understood. Recently, also, the subspecific assignment of Acanthis hornemanni exilipes has been questioned, but on the basis of winter specimens, which are always more or less unsatisfactory for the delimitation of geographic races. It is claimed by this author 3 that Acanthis hornemanni exilipes is a

<sup>&</sup>lt;sup>1</sup> Canadian Alpine Journal, Special Number, 1912 [February 17, 1913], pp. 70-71.

<sup>&</sup>lt;sup>2</sup> Brooks, 'The Auk,' XXXIV, No. 4, January, 1917, p. 44.

<sup>&</sup>lt;sup>3</sup> Brooks, loc. cit.

subspecies of Acanthis linaria, because it intergrades perfectly with that species, but not with Acanthis hornemanni. While of course in some plumages certain specimens are difficult to distinguish, the same is true of many another distinct species. Present comparisons, based on specimens in breeding plumage, show that Acanthis hornemanni exilipes and Acanthis linaria linaria are usually separable by the white rump and the slight streaks on the under tail-coverts of the former, which are the characters that ally Acanthis hornemanni exilipes to Acanthis hornemanni hornemanni; in fact, in ordinary condition Acanthis hornemanni exilipes is a miniature of Acanthis hornemanni hornemanni, though it averages somewhat darker. A further and serious obstacle to considering Acanthis hornemanni exilipes a subspecies of Acanthis linaria linaria is that both breed on the same ground over a wide geographic area extending from Ungava to southern Keewatin and Alaska, and that they retain their distinctive characters everywhere, although apparently sometimes hybridizing. It is evident, therefore, that whatever the relationship of Acanthis hornemanni exilipes to Acanthis hornemanni hornemanni, the former cannot by any means be a subspecies of Acanthis linaria.

# THE SUBSPECIES OF LARUS HYPERBOREUS GUNNERUS.

### BY HARRY C. OBERHOLSER.

No subspecies of Larus hyperboreus have hitherto been formally recognized. Recent investigation, however, has shown that the bird of Alaska, described by Mr. Ridgway as Larus barrovianus, is a readily separable race. Its relationships with Lurus hyperboreus hyperboreus are set forth below.

For the purpose of the present study the writer has been privileged to examined 240 specimens, including the type of Larus barrovianus, which number represents the entire material of this species in the collections of the following institutions and individuals: the United States National Museum, including the Biological Survey; the Academy of Natural Sciences of Philadelphia; the American Museum of Natural History; the Museum of Comparative Zoölogy; and the Brooklyn Museum of Arts and Sciences; Mr. John E. Thayer, Mr. William Brewster, Mr. A. C. Bent, Dr. J. Dwight, Dr. L. B. Bishop, and Dr. L. C. Sanford.

# Larus hyperboreus hyperboreus Gunnerus.

[Larus] glaucus Brunnich, Ornith. Bor., 1764, p. 44 (Iceland) (nec Larus glaucus Pontoppidan, 1763, qui Larus canus Linnæus).

Larus hyperboreus Gunnerus, in Leem's Beskr. Finm. Lapper, 1767, p. 226. footnote (northern Norway).

Larus giganteus Benicke, Ann. Wetterau. Gesellsch., III, 1812, p. 140 (Baltic Sea, northern Europe) (Temminck MS.).

Larus maximus O'REILLY, Greenland, the Adjacent Seas, etc., 1818, p. 141, pl. XIII (Greenland Seas) (nec Larus maximus Forster, 1817, qui Larus marinus Linnæus) (Bullock MS.).

Larus leuceretes Schleep, Ann. Wetterau. Gesellsch., IV, Heft II, 1819, p. 314 (in text) (far north [of Europe]; accidental on coast of Germany) (Meyer MS.).

Larus consul Boie, (Wiedemann's) Zool. Mag., I, pt. III, 1819, p. 126 (near Helsingör, Denmark).

Larus medius Brehm, Beitr. Vogelk., III, 1822, p. 810 (Seeland I., Denmark).

Larus islandicus Edmonston, Mem. Wern. Soc., IV, 1822, p. 185.

Larus minor Brehm, Handb. Naturg. Vög. Deutschl., 1831, p. 736 (nom. nov. pro Larus medius Brehm).

Larus glacialis Brehm, Lehrb. Naturg. Europ. Vögel, II, 1824, p. 704 (extreme northern colony of Greenland) (Benicke MS.).

Larus Hutchinsii Richardson, Fauna Bor.-Amer., II, 1831 (1832), p. 419 (Albany River, Ontario).

CHARS. SUBSP. - Size large; mantle pale.

MEASUREMENTS. — Male: wing, 457–483 (average, 468) mm.; tail, 190–213 (198); exposed culmen, 60–69 (63.8); height of bill at base, 21–26 (23); tarsus, 70–75 (72); middle toe with claw, 69–74 (71).

Female: wing, 432-451 (average, 441) mm.; tail, 184-206 (191); exposed culmen, 56-61 (57.9); height of bill at base, 19-22 (20.2); tarsus, 66-73 (69); middle toe with claw, 63-72 (67).

<sup>&</sup>lt;sup>1</sup> From Dwight, 'The Auk,' XXIII, No. 1, January, 1906, p. 28, except for dimensions of bill, which have been remeasured for the present use.

TYPE LOCALITY .- Northern Norway.

GEOGRAPHIC DISTRIBUTION. - Europe, Asia, eastern and middle North America. Breeds north to Wrangell Island in northeastern Siberia, New Siberia Islands north of Siberia, Crown Prince Rudolph Island in Franz Josef Land, Spitzbergen, northern Greenland, Grant Land, and Prince Patrick Island in Franklin Territory; west to Prince Patrick Island, Melville Island, and Coronation Gulf in Mackenzie: south to Coronation Gulf, Cape Fullerton in Keewatin, Great Whale River in central western Quebec (Ungava), Newfoundland, Hopedale in eastern Labrador, southern Greenland, Iceland, northern Norway, and the coast region of northeastern Europe and northern Siberia; and east to the Pribilof Islands, Alaska, and the Diomede Islands, northeastern Siberia. Winters north to the coast region of northern Siberia, the coast of northern Europe, Iceland, southern Greenland, and Baffin Land; and south to Japan, the northern part of the Caspian Sea, Akaba on the northern part of the Red Sea, Gibraltar, England, Ireland, North Carolina, northern Pennsylvania, northwestern Indiana, and casually to northern Texas.

Remarks.— In this, the typical form of the species, the mantle is very constantly pale, but size as a differential character is more variable. Birds from Davis Strait and Cumberland Sound, west of Greenland, seem to be as large and pale as Old World examples. All of the birds examined from eastern Siberia and Japan belong also to this race. A single adult from Walrus Island in the Pribilof group, taken, June 13, 1890, and now in the United States National Museum, is very large and pale; in fact, is of maximum size, and in color fully as light as the palest specimens of the present race; and, since the species is known to breed on this island, probably represents the resident form. A single specimen from Akaba on the northeastern arm of the Red Sea is the southernmost record for any form of Larus hyperboreus.

The well-known wholly white plumage phase of this gull, which was described by Richardson as Larus hutchinsii, seems to be, as indicated by Dr. J. Dwight, a subadult plumage of the second year, although it is possible that not all individuals pass through this condition. As explained under Larus hyperboreus barrovianus, the specimen of Glaucous Gull already recorded from northern Texas proves to belong to that race; but there is in the collection

2 'The Auk,' XXIII, No. 1, January, 1906, p. 32.

<sup>&</sup>lt;sup>1</sup> Fauna Bor.-Amer., II, 1831 (1832), p. 419 (Albany River, Ontario).

of the Museum of Comparative Zoölogy at Cambridge, Massachusetts, where it is number 32371, an additional Texas specimen, taken by Mr. G. H. Ragsdale in northern Texas, presumably near Gainesville, but without exact date of capture, which is an example of Larus hyperboreus hyperboreus.

The name Larus glaucus Brünnich, which has until recently been used for this species, is found to be preoccupied by Larus glaucus Pontoppidan, which is a synonym of Larus canus Linnseus. The proper name for the species, therefore, becomes Larus hyperboreus Gunnerus, which, in point of date, is the next available name.

Of Larus hyperboreus hyperboreus 129 specimens have been examined, from the localities in the subjoined list:

Alaska. - Walrus Island, Bering Sea (June 13, 1890).

Franklin.— Brevoort Island, Ellesmere Land (May 21, 1900; June 10, 1901; Aug. 1, 1900; July 25, 1900 [nestling]); Rice Strait, Ellesmere Land (June 5 and 8, 1901); Cape Sabine, Ellesmere Land (Sept. 15, 1900); Buchanan Bay, Ellesmere Land (June 10 and 16, 1901); Alexander Haven, Ellesmere Land (July 25, 1900); Cumberland Sound (June 27, 1878; Sept. 6, 1878); Niantilik, Cumberland Sound (Aug. 8, 1876; Sept. 17, 1877); Observatory Island, head of Cumberland Sound (June 4 and 6, 1878); Davis Strait (Aug. 12 and 15, 1879); Cary Island, Baffin Bay (July 24, 1894); Simpson Bay, Victoria Land (July 26, 1911 [nestling]); Meteorite Island (Aug. 13, 1897 [nestling]).

Greenland.— Sukkertoppen (Sept. 1, 1904; Oct. 24, 1905; April 25, 1906; Dec. 3, 1909); Kahkoktah Cove (Sept. 1, 1893); Anniversary Lodge (Sept. 11, 1893); Bowdoin Bay (Sept. 9, 1893); McCormick Bay (Aug. 4, 1892 [nestling]); Robertson Bay (Aug. 23, 1892); Itiblu (July 22, 1892); Littleton Island (July 22 and 27, 1892); Cape York (July 26, 1892); Port Foulke; Holsteinborg (June 20, 1895; July 6, 1895; May 12, 1897; Sept. 21, 1898); Parker Snow Bay (Aug. 11, 1896); Julianehaab (April 6, 1908; May 4, 1909); Nyskotefjord (Aug. 17, 1900); Etah (July, 1910);

<sup>&</sup>lt;sup>1</sup> Ornith. Bor., 1764, p. 44 (Iceland).

<sup>&</sup>lt;sup>2</sup> Danske Atlas, I, 1763, p. 622.

<sup>&</sup>lt;sup>3</sup> In Leem's Beskr. Finm. Lapper, 1767, p. 226 (footnote).

Umanak (August, 1896); Hakluyt Island (July 19, 1901); Northumberland Island (July 11, 12, and 18, 1901).

Labrador.— Ramah (July, 1898); Lance au Loup (Dec. 1 and 17, 1899); Okak (July 19, 1896); Ailik (Nov., 1899); Nakvak (autumn, 1883).

Mackenzie.— Coronation Gulf (July 20, 1911 [nestling]; June 15, 1911).

New Brunswick.— Grand Manan I. (March, 1883; March 1, 1884; Feb. 10, 1898; Jan. 25, 1874).

Newfoundland .- Curselet (Dec. 31, 1894).

Nova Scotia. - Sable Island (Jan. 2, 1895; Feb. 12, 1895).

Quebec.— Tadousac (winter, 1901); Fort Chimo, Ungava (Dec. 18, 1882).

Maine.—Portland (Jan. 19, 1900; Mar. 4, 1891); Kittery Point, York County (Feb. 14, 1891); Ilsford (Dec. 20, 1886).

Massachusetts.— Charles River, Boston (April 4, 1881); Chatham (Feb. 13, 1917).

New York.— Washington County (January, 1860); Sag Harbor, Suffolk County (Dec. 11, 1890); Montauk, Long Island (Feb. 8, 1890).

Texas - [near Gainesville].

Great Britain. - Breakness, Orkney Islands (March 18, 1869).

Norway. - Bergen (Feb. 2, 1882).

Spitzbergen.— Isfjarden (June 16, 1900); Green Harbor (August, 1881).

Japan.— Otaru, Hokkaido Island (Feb. 20, 1899); Shiribeshi (November, 1906); Hakodate (March 25, 1887).

Siberia.—Kolyuchin Bay (July 9, 1909 [5 nestlings]); Cape Serdze (July 29, 1910); Novo Marinsk, at head of Gulf of Anadyr (1901); Diomede Islands, Bering Strait (July, 1881); Gichiga (Sept. 21, 1900); Whalen Bay (July 20, 1910); Indian Point (August 9, 1910); Cape Bolshaja Baranow (July 6, 1912); Koliutschin Island (July 3 and 9, 1909 [nestlings]); northeastern Siberia (June 4 and 5, 1907); Semiavine Strait (= St. Lawrence Bay).

Turkey in Asia. - Akaba, Red Sea (April 18, 1914).

# Larus hyperboreus barrovianus Ridgway.

Larus barrovianus Ridgway, 'The Auk,' III, No. 3, July, 1886, p. 330 (Point Barrow, Alaska).

Chars. Subsp.— Similar to Larus hyperboreus hyperboreus, but smaller, the bill particularly so, and relatively as well as actually more slender; mantle decidedly darker; and the line of demarcation between the white tips to the primaries and the pale grayish basal portions usually more evident.

MEASUREMENTS.\(^1\)— Male: wing, 444-470 (average, 458) mm.; tail, 178-197 (189); exposed culmen, 56-65 (61.1); height of bill at base, 20-22 (20.9); tarsus, 69-74 (71); middle toe with claw, 66-72 (69).

Female: wing, 425–457 (average, 436) mm.; tail, 171–190 (180); exposed culmen, 46–60 (52.7); height of bill at base, 17–21 (18.7); tarsus, 62–73 (66); middle toe with claw, 58–71 (63).

TYPE LOCALITY. - Point Barrow, Alaska.

GEOGRAPHIC DISTRIBUTION.— Western North America. Breeds on the Arctic coast and islands north to Franklin Bay, northwestern Mackenzie, Hershel Island, Yukon, and Point Barrow, Alaska; west to the western coast of Alaska and to Unalaska Island; south to Unalaska Island, Amak Island, and the coast region of northern Yukon and northwestern Mackenzie; east to Amak Island, and the coast region of western Alaska and Franklin Bay in northwestern Mackenzie. Winters north to the Pribilof Islands and the Aleutian Islands; and south along the Pacific Coast to Monterey, California. Accidental in northern Texas.

Remarks.— Mr. Robert Ridgway first noticed the differences characterizing this race, and many years ago described it from a specimen taken at Point Barrow, Alaska, as a distinct species, under the name Larus barrovianus.<sup>2</sup> His emphasis on the relatively greater depth of the bill at the angle of the gonys, as compared with its depth at base, which now proves to be an inconstant character, was the evident reason for the rejection of the form by Dr. Dwight,<sup>3</sup> and its relegation as a synonym to Larus hyperboreus. Although the relatively greater depth of the bill at the angle of the gonys proves to be valueless as a character to separate Larus barrovianus, this bird is very readily recognizable by its usually smaller size and particularly smaller bill, but especially

<sup>&</sup>lt;sup>1</sup> From Dwight, 'The Auk,' XXIII, No. 1, January, 1906, p. 28, except for dimensions of bill, which have been remeasured for the present use.

<sup>&</sup>lt;sup>2</sup> The Auk,' III, No. 3, July, 1886, p. 330.

<sup>3</sup> The Auk, XXIII, No. 1, January, 1906, pp. 27-29.

by its decidedly darker mantle. Although it really is but subspecifically different from *Larus hyperboreus*, the restoration of this form of Mr. Ridgway's to standing among North American gulls is a pleasurable privilege.

This race appears to be confined in the breeding season to Alaska and the territories of Yukon and western Mackenzie. No Japanese specimens have been detected among those examined, but it is not at all unlikely that Larus hyperboreus barrovianus does occasionally migrate to Japan. The specimen of Glaucous Gull already recorded from the Red River in Clay County, Texas, proves to belong to the present race. The type of Larus hyperboreus barrovianus is No. 88913 of the United States National Museum register, and is still in the collection. It was taken on August 4, 1882, by Middleton Smith, at Point Barrow, Alaska. It agrees with other specimens of this subspecies in size, but is somewhat paler on the mantle than usual individuals, and is possibly not quite adult.

We have examined 111 specimens of the present race, from the following localities:

Alaska. - St. Michael (June 15, 1880; June, 1866; Sept. 21, 1877; Sept. 18, 1875; Sept. 1, 1876; July 15, 1866; July 15, 1915; Sept. 3, 8, and 13, 1899; June 28, 1915; Aug. 8 and 14, 1915); Point Barrow (Aug. 5 and 18, 1882; July 26, 1883; May 21, 1881; Sept. 9 and 15, 1882; June 1, 1882; Sept. 5, 17, 23, and 28, 1897; Aug. 11, 20, 24, 26, and 27, 1897; June 1, 2, 8, and 17, 1898; Oct. 5, 1897); Kowak River; St. Paul Island, Pribilof Islands (June 21, 1890); Bethel (July 14, 1914; Aug. 18, 1914; July 24, 1915); Unalaska, Unalaska I. (June 9, 1911; Nov. 1, 1903; Nov. 12, 1904); Beaver Inlet, Unalaska Island (July 4, 1901 [nestling]); near Bering Strait; Nome (Sept. 19 and 21, 1913; Sept. 2 and 11, 1910; July 28, 1902; Aug. 20, 1903; Aug. 10, 1902; Sept. 14, 1900; summer, 1901); Pikmiktalik River (July 1-15, 1877); Amak Island (July 18, 1911 [nestling]; Camden Bay (Aug. 4, 1913); Port Clarence (July 27, 1895; July 24, 1897); Yukon Delta (June 29, 1914); Wainwright Inlet (Aug. 17, 1914); Gwydyr Bay (July 16, 1910); Barter Island (Sept. 4, 1908); Kulugrua River (July 13, 1898 [nestling]); Demarcation Point (June 10, 1914); Griffin Point (July 12, 1914); Nelson Island (July 24, 1911); near Flaxman Islands, Arctic Ocean (July 31, 1913); Chamisso I. (Aug. 1, 1914).

British Columbia. - Comox (Nov. 9 and 15, 1903).

Mackenzie.— Langton Bay, arm of Franklin Bay (Sept. 12, 1910); Franklin Bay (June, 1905); Mackenzie River Delta (July 28, 1908; Sept. 8, 1909); mouth of Horton River, Franklin Bay (spring or summer, 1908).

Yukon. - Mouth of Firth River (Aug. 1, 1914 [nestling]).

California.— Monterey (Jan. 26, 1897; March 15, 1897); California (no further data given).

Texas. - Red River in Clay County (Dec. 17, 1880).

Washington.— Tacoma (May 2, 1914); Seattle Harbor (May 12, 1896).

### GENERAL NOTES.

Cause of the "Fishy" Flavor of the Flesh of Wild Ducks.— Occasional specimens of wild ducks, apparently of any of the species, prove upon trial to have an unpleasant taste, which usually is called "fishy." The general conclusion in such cases is that the particular bird involved acquired its unusual flavor by feeding upon fishes. In other words fishiness is caused by eating fishes and everything that lives upon fishes is fishy.

To the writer it has long seemed that this theory, statement and conclusion are open to challenge. In the first place the majority of the species of wild ducks ordinarily eat very few fishes and secondly it is entirely improbable that an individual wild duck would depart so widely from the habitual feeding habits of its kind, and for so long a time, that as a result its flesh would be tainted.

Let us inquire into the matter of fish-eating causing fishiness. The importance of plentiful and cheap sources of protein has led to investigations of the value of fish as food for various animals, and among other points, that of the influence of this food upon the meat and other products has received attention. Investigations of the United States Department of Agriculture are summarized <sup>1</sup> as follows: "From the feeding experiments it appears that there has not been just cause for the assumption that the feeding of fish meal of good quality imparts a fishy taint to such products as milk, butter, eggs and meat....if fed in reasonable amounts in conjunction with other foods." <sup>2</sup>

<sup>&</sup>lt;sup>1</sup> Weber, F. C. Bull. 378, p. 20, 21, Aug. 22, 1916.

<sup>&</sup>lt;sup>2</sup> This conclusion is corroborated in the following publications also. Live Stock Journ. (London), 77, 1913, No. 2039, pp. 463-4; Rev. Centro, Estud. Agron. y Vet., 7, 1914, No. 72, pp. 258-270; Bull. 610, U. S. Dept. Agr. Dec. 7, 1917, pp. 9.

What is the case with wild birds, even of those species that feed very largely upon fishes? William Brewster informs me that he has eaten young of both Loons and Red-breasted Mergansers and found them very good; the old birds he found tough and undesirable but not fishy. Dr. A. K. Fisher has tasted Mergansers of all three of our native species and reports that none of them tasted fishy. E. A. Preble agrees with this, but remembers that an adult Loon he tried was very bad and of a flavor he would call fishy. Vernon Bailey says that in his experience Mergansers have a rank but not fishy taste, and that the Hooded Merganser in fall is as delicious as any duck. Dr. Fisher has eaten both Hell-divers and Eared Grebes and found neither of them fishy. The writer's experience is the same; the latter has tested terns also and found them with a strong flavor like salted and smoked meat but not fishy. Mr. Preble has found young Gulls very palatable. Dr. Fisher gives the same finding for Razor-billed Auks and Murres. Bitterns are reported excellent by Messrs. Bailey and Brewster, the latter stating that one baked in a pit, was the most delicious bird he ever ate. The little Green Heron and Night Heron are favorably reported upon by Dr. Fisher. The Night Herons, or 'Gros-becs' as they are known in the region are a prized delicacy among the Louisiana Creoles. Mr. Brewster found Kingfishers very good.

Now all of the birds above mentioned feed more or less extensively upon fishes, the approximate proportion of their diet consisting of fish being indicated in the following list: Grebes 25%, Loons 80%, Razor-billed Auk and Murres 60%, Gulls 50%, Terns 75%, Hooded Merganser 25%, other Mergansers 90%, Bittern 15%, Little Green Heron 40%, Night Heron 40%, and Kingfisher 75%. It is thus perfectly evident that even habitual feeding upon fishes to a large proportion of the total subsistence, does not necessarily cause a fishy flavor in the flesh of the predator.

A fact that has a converse hearing upon the argument is that a definitely fishy flavor exists in various media with which fishes have no connection. For instance water in wells and even in large reservoirs and lakes sometimes has a pronounced fishy taste. Public opinion attributes this to the influence of fishes in these bodies of water; the real cause however, is the presence of certain algae in great abundance. The development of a fishy flavor has been observed in milk and butter and seems to be due to chemical or bacterial changes when these products have an abnormally high acidity. These cases establish the fact that fishy flavor does not necessarily result from contamination from fishes.

From the facts adduced it appears that: (1) certain individual birds of species not habitual fish eaters have their flesh tainted by a flavor which popularly is called "fishy," but that, (2) habitual fish-eating birds do not necessarily taste fishy nor do the products of animals fed upon fish-meal,

<sup>&</sup>lt;sup>1</sup> See Bull. 64, U. S. Bur. Plant Industry, 1904, 44 pp.

<sup>&</sup>lt;sup>2</sup> See Circ. 146, U. S. Bur. Animal Industry, 1909, 20 pp., and Research Bull. 38, Iowa Agr. Exp. Sta. 1917, pp. 235-246.

as milk, butter, eggs and meat, and finally (3) a distinctly fishy flavor is evident in water, milk and butter under circumstances that preclude its being derived from fishes. I conclude therefore that the occasional so-called fishy bird probably does not taste thus because it has been feeding upon fishes. More probably the flavor of its flesh results from the physiological condition of the individual bird. It may be due to by-products of the breaking down of fat, the reserve upon which such an individual has made great drafts, and the process may be similar to what takes place in fishy butter.— W. L. MCATEE, Washington, D. C.

Cinnamon Teal (Querquedula cyanoptera) in North Dakota.—In the course of investigations of the wildfowl of North Dakota the writer was fortunate enough to find a pair of Cinnamon Teals (Querquedula cyanoptera) on June 15, 1918, in a slough adjoining Cherry Lake, Kidder County, in the south central part of the State. These birds were in the same pond with a number of Blue-winged Teals; were evidently mated; and were without much doubt breeding in the immediate vicinity. The locality is some three or four miles west of the northern end of Horsehead Lake, which is one of the largest lakes of the immediate region. So far as we are aware there is no other authentic summer record for the Cinnamon Teal in North Dakota.— HARRY C. OBERHOLSER, Washington, D. C.

White-winged Scoter (Oidemia deglandi) in South Carolina.— A mature male of his species was taken by me on January 31, 1918, on the eastern branch of Cooper River. The water was perfectly fresh and no unusual weather conditions existed. The specimen was alone, flying quite low and vigorously. No others have been seen by me either then or at any other time.— E. A. Simons, Charleston, S. C.

The Specific Name of the Glossy Ibis.— The Glossy Ibis is commonly known scientifically as Plegadis autumnalis (Linnæus) (Tringa autumnalis Linnæus, in Hasselquist, Reise Paläst., 1762, p. 306. [Egypt]). Since, however, Hasselquist's Reise Palästina is merely a translation of the same book in Latin published prior to 1758, the scientific names it contains are undoubtedly untenable, according to the International Code of Nomenclature, as interpreted by Opinion 57 of the International Commission on Zoological Nomenclature. If this be satisfactory as a guide for our North American ornithological nomenclature, as we think it should be, we must change the name of the Glossy Ibis from Plegadis autumnalis (Linnæus) to Plegadis falcinellus (Linnæus) (Tantalus falcinellus Linnæus, Syst. Nat., ed. 12, I, 1766, p. 241), as already shown by Mr. G. M. Mathews (Birds of Australia, III, pt. 5, 1914, pp. 396–397).— Harry C. Oberholser, Washington, D. C.

<sup>1</sup> It should be noted that animals in poor order often have a rank taste.

Nesting of the Bittern (Botaurus lentiginosus) in the Delaware Valley.— The Bittern is erroneously supposed to be a rare breeder in New Jersey, but recent researches by Mr. Richard C. Harlow along the maritime marshes have proven that it is a regular summer resident there; although it seems to be an extremely rare breeder anywhere in the Delaware Valley and particularly in the vicinity of Philadelphia.

On June 5, 1915, while exploring the marshes and swamps along a small creek at Woodbury, Gloucester County, N. J., in company with Turner McMullen, of Camden, N. J., we discovered a Bittern's nest; it was placed flat upon the muddy ground near the edge of a small patch of calamus and contained three nestlings and one rotten egg. The young birds were about a week old and the egg contained a dead chick. The nest was a mass of green and dead reed stalks, unattached to the tules and was fairly well hidden.

Woodbury is about eight miles from Philadelphia, to the south, situated upon Woodbury Creek and about a mile inland from the Delaware River. The nest was at the southern end of the town and is the first one ever found in the vicinity of Philadelphia, to my knowledge.— RICHARD F. MILLER, Philadelphia, Pa.

Yellow-crowned Night Heron at Chicago.— On Sunday, April 14, 1918, a friend and I were studying the birds in Jackson Park, Chicago, Ill. I was told that a specimen of Nyctanassa violacea had been seen in the park, At first I was incredulous, as the occurrence of this species in this latitude so early in the season is extremely unusual. Having approached within fifty feet of the bird I was able to assure myself of its identity. Unfortunately I was unable to secure the specimen. The bird allowed me to study it at close range for several minutes. At the expiration of this time it flew, confirming my opinion that its wings were not clipped. The bird was observed by many others. The next day, although I searched diligently, I was unable to find it.— NATHAN F. LEOPOLD, JR., Chicago, Ill.

The Black Vulture (Catharista urubu) in Indiana.— Professor Butler, in his 'Birds of Indiana' p. 769, states that the Black Vulture is "Resident in the southern part of the State; generally not numerous, but, in the lower Wabash Valley, at least from Knox County southward, it is common." Mr. McAtee, in his 'Birds of the University of Indiana,' notes the bird as quite rare in the State.

While en route from St. Louis to Washington on May 5, 1918, over the B. & O. Southwestern R. R., about five miles east of North Vernon, in Jennings County, Indiana, I saw two Black Vultures just after they had risen from the ground near the train and were ascending some thirty feet, where they joined a Turkey Vulture which was leisurely sailing around the locality.— R. W. WILLIAMS, Washington, D. C.

The Status of Buteo platypterus iowensis.— The new race of Buteo platypterus described by the late Prof. B. H. Bailey as Buteo platypterus iowensis ('The Auk,' XXXIV, No. 1, January, 1917, p. 73) was based on a specimen from Eagle Lake, Hancock County, Iowa. Its distinction from Buteo platypterus platypterus consists in its sooty brown plumage both above and below; and its geographic distribution extends from Manitoba to Iowa. It develops, however, on further investigation that examples of Buteo platypterus of the ordinary light type inhabit the same breeding range in Manitoba, Minnesota, and North Dakota. Since, of course, two geographic races of the same species cannot have identical breeding areas. it follows that we must seek some other reason for the existence of the dark Broad-winged Hawks that live in the upper Mississippi Valley. Mr. Robert Ridgway has already recorded (Proc. U. S. Nat. Mus., IX, 1886, p. 248) a dark Buteo platypterus from Iowa as an example of melanism in this species; and this evidently is the correct explanation. That nearly all these dark birds come from Iowa, Minnesota, and Manitoba is interesting, but does not militate against the view of their melanistic character, for it is well known that melanism and similar color phases may occur in one part of the range of a species and be totally absent in another. Furthermore, melanism in the genus Buteo is of common occurrence; and notable examples of this are Buteo borealis, Buteo swainsoni, and Buteo ferox. From the foregoing it seems necessary to treat Buteo platypterus iowensis as a synonym of Buteo platypterus platypterus.— HARRY C. OBERHOLSER.

Flight of Horned Owls in Canada.— The article by Mr. Arthur W. Brockway in 'The Auk' (Vol. XXXV, No. 3) upon the 'Large Flight of Great Horned Owls and Goshawks at Wadlyme, Connecticut' has prompted me to revert to the subject in connection with the phenonenon here. Any occurrence of this nature is particularly interesting and especially so among the Raptores of the North.

His information regarding the early November flight in Canada is perfectly correct; vast numbers having appeared at that time throughout the country. Mr. C. W. Nash, of the Provincial Museum, Toronto, informed me that hundreds of Great Horned Owls were noted in that region and in every locality that I have visited the same news of excessive numbers of these birds has reached me.

During the latter part of October, 1917, and the fore part of November I was in the wilderness northeast of Lake Superior. During my entire time there, I never once heard an owl, although they are frequently heard in wilderness camping. I remarked on the apparent absence of the species at the time, and often sat alone on the quiet shores of the lake at night, listening for the voice I had learned to enjoy, but not once did a lonely "hoot" disturb the silence of the solitude.

Every one there also remarked on the scarcity of the Varying Hare, as compared with the numbers usually present. After the first fall of snow I noted occasional signs, and also procured a specimen, but their numbers were negligible. Grouse too, were scarce.

The significance of the whole thing dawned upon me when on November 7, the first day after my return to Southern Ontario, I noted several Horned Owls, which was an uncommon occurrence. The day previous a friend had observed three. These birds were lazily perched in the open hardwoods enjoying the sunshine, and quite apparently oblivious to their surroundings. This is contrary to the usual secretive habits of the birds when here.

Continuously throughout November these owls were frequently observed and many were shot for taxidermic purposes. After this month their numbers were reduced but signs of their killing, usually a luckless Cottontail, was noted with greater frequency than is usually the case.

Personally, the ingress of Goshawks was not noted as exceptional, although greater numbers may have prevailed in other localities. Each fall sees a certain influx of these destructive birds, with their bold propensities for domestic fowl, much to the vexation of most poultry-men.

To reiterate: The point of interest lies in the fact that the Horned Owls were apparently absent from the north country at the time of my trip October 20-November 6; common on my return to Preston, Ont. November 7, and apparently so at other points in southern Canada; with their subsequent invasion of the northern States, which I assume immediately followed as indicated by Mr. Brockway's communication to 'The Auk.'—J. Dewey Soper, Preston, Ont.

Picoides arcticus in Florida. - Through the courtesy of Mr. J. D. Allen, of Mandan, North Dakota, the writer is privileged to record a specimen of the Black-backed, or Arctic, Three-toed Woodpecker (Picoides arcticus), which Mr. Allen collected himself on Pablo Creek, northeastern Florida, about March 20, 1875. Pablo Creek enters the St. John River a few miles west of Mayport, and the point at which this Three-toed Woodpecker was taken lies well up toward the source of this stream, which would make it some distance southwest of Mayport, the exact number of miles being now not determinable. The specimen is an adult male in perfect plumage, although by reason of being mounted is now in somewhat dilapidated condition. It has never been out of Mr. Allen's possession, and his recollection of the circumstances of its capture are periectly clear and conclusive. It is an astonishing record for the State of Florida, and one that is not likely ever to be duplicated. The occurrence of a far northern species such as this so far south of its normal range naturally invites speculation as to the probable cause of its presence there, but it certainly was not a cage bird. - HARRY C. OBERHOLSER, Washington, D. C.

Early Nesting of the Northern Pileated Woodpecker in Pennsylvania.— According to the experience of field oölogists of Pennsylvania, the right time to find fresh clutches of the Northern Pileated Woodpecker

(Phlaotomus pileatus abieticola) in this State is May 10-15, consequently I was surprised to find a nest on May 20, 1918, in northern Huntingdon County containing three nestlings about one week old. The nest was seventy feet up in the dead top of a large rock oak in a thick forest.

Judging by the age of the young birds and allowing eighteen days for the incubation of the eggs, this early pair must have had a fresh set about April 25.

Three other nests found by Richard C. Harlow and the writer this year, in the same county held fresh and slightly incubated eggs on May 16 and 17, respectively.—RICHARD F. MILLER, *Philadelphia*, *Pa*.

Relative Length of the Intestinal Cæca in Trogons.— In his article on 'The Anatomy of the Cuban Trogon' in 'The Auk' for July, 1918 (p. 286), Dr. H. L. Clark records the length of the intestines and cæca of this trogon and remarks "The cæca are thus relatively very long, much longer than in the species of Trogon and Pharomacrus examined by Garrod."

I have examined the viscera of twelve specimens, representing six species, of Central American Trogons. These with the four individuals recorded by Garrod and Clark give us for comparison a total of eight species belonging to three very distinct groups of Neotropical Trogonidæ. The following figures express the ratio of the length of the cæca to that of the intestines, the latter being represented by 100.

Pharomachrus mocinno	(7 specimens),	9.3
Trogonurus mexicanus	(1 specimen),	10.6
" puella	(2 specimens),	13.8
" curucui	(1 specimen),	14.6
Chrysotrogon caligatus	(1 specimen),	16.2
Trogonurus elegans	(2 specimens),	16.7
Trogon melanocephalus	(1 specimen),	17.2
Priotelus temnurus	(1 specimen),	17.8

Thus in Pharomachrus the cæca average slightly more than one-eleventh of the total length of the intestinal tract, while in Priotelus they exceed one-sixth of the intestinal length. In Pharomachrus they are relatively shorter than in the other genera but Trogonurus mexicanus connects the two groups. The figures indicate that the cæca of Priotelus are a trifle longer than those of Trogonurus, Chrysotrogon and Trogon, but there is great individual variation in the length of these appendages and additional specimens will undoubtedly show that there is at most only a slight average difference.— W. DEW. MILLER, American Museum of Natural History, New York City.

The Range and Status of Aphelocoma californica hypoleuca Ridgway.

— As information supplemental to Mr. H. S. Swarth's excellent revision

of the North American forms of the genus Aphelocoma occurring on the Pacific coast (Univ. Calif. Publ. Zool. Vol. 17, No. 13, Feb. 23, 1918, pp. 405-422), the following may be of interest:

The lack of pertinent material has led Mr. Swarth to restrict the distribution of Aphelocoma californica hypoleuca to the extreme southern end of the Lower California peninsula, and because its range is thus seemingly isolated, to consider it a species distinct from Aphelocoma californica. Material in the Biological Survey Collection in the United States National Museum proves that jays of the Aphelocoma californica type have a practically continuous distribution throughout Lower California. Mr. Swarth refers to Aphelocoma californica obscura, or, as he calls it, Aphelocoma californica californica, specimens from Santana, which is some distance south of the San Pedro Martir Mountains, and about one-third of the way down the peninsula to Cape San Lucas, at approximately north latitude 29° 20'. Birds from Yubay, Lower California, which lies only a short distance southeast of Santana in about north latitude 29° 15', are decidedly intermediate between Aphelocoma californica hypoleuca, of the Cape San Lucas region, and Aphelocoma californica obscura of the San Pedro Martir Mountains, being darker both above and below than the former, but not sufficiently so to be referred to the latter. Birds from Calmalli, some distance farther southward, at about north latitude 28° 15', are nearly the same, though nearer in characteristics to Aphelocoma californica hypoleuca; and a specimen from San Andres, between Yubay and Camalli, is similar. These seven specimens, together with specimens from San Bruno and Mulejé, which lie still farther to the south, form a complete chain of intermediates between Aphelocoma californica obscura and Aphelocoma californica hypoleuca, making necessary, of course, the use of a trinomial for the latter. The geographic distribution of Aphelocoma californica hypoleuca should, therefore, be extended from the region about Cape San Lucas northward to the vicinity of Yubay, Lower California, at approximately North Latitude 29° 15' .- HARRY C. OBER-HOLSER, Washington, D. C.

The Starling at Plattsburg, N. Y.— While at the second officers' training camp, I observed a flock of five Starlings (Sturnus vulgaris) flying over the town some time the first week in October, 1917. It is believed that this is the farthest north that this species has been noted.— Ludlow Griscom, 2nd Lieut., Inf., O. R. C.

The Northernmost Record of Icterus parisorum.— While engaged in field work for the Biological Survey, the writer was fortunate enough to obtain a specimen of Icterus parisorum in central western Nevada, which considerably extends the range of the species. This bird is an adult female and was taken in the mountains ten miles east of Stillwater, Nevada, and northeast of Carson Lake. It was obtained on May 11, 1898, among

the junipers in a little valley, and was accompanied by its mate, which Mr. Vernon Bailey was fortunate enough to collect at the same time. These captures extend the known range of the species one hundred miles north of Queen Mine, in the White Mountains of Nevada (cf. Fisher, North American Fauna, No. 7, 1893, page 76), its previous limit in this region. They also form the northernmost record of the species.— HARRY C. OBER-HOLSER, Washington, D. C.

\*The Slate-colored Junco (Junco hyemalis hyemalis) breeding near Boston. - On June 4, 1918, Miss Agnes J. Galligan discovered a pair of Juncos (Junco hyemalis hyemalis) in some rocky oak woods in West Roxbury, Mass. I visited the place with her on June 7 and found the male bird with one young one in the speckled juvenal plumage, pretty well fledged and able to fly. We did not see the female, and we saw but the one young bird, though I thought at one time that I heard another calling. The note of the young was a trisyllabic zi-zi-zi. On July 1, Miss Galligan found the pair in another locality, about an eighth of a mile away, feeding a young bird which was evidently of a second brood, as it could not fly and was apparently just out of the nest. I visited the spot July 3, but saw nothing of the birds in the limited time at my disposal, though I heard the male singing. The breeding of the Junco in eastern Massachusetts is sufficiently uncommon to make the occurrence seem worth recording, especially as it is evident that two broods were hatched. West Roxbury is a part of Boston, and I know of no previous record of the breeding of this species within the limits of that city. — Francis H. Allen, West Roxbury, Mass.

Blue-winged Warbler Once More Nesting at South Sudbury, Mass. - On May 24, 1918, in a walk in South Sudbury in the Wayside Inn region, I came upon a Blue-winged Warbler (Vermivora pinus) singing. The location was within a mile of the nesting in 1909, recorded in 'The Auk, Vol. XXVI, October, 1909, pp. 337-345. The bird disappeared after several repetitions of his song before I had secured a view of him. But there remained in my mind no uncertainty that I had heard the song of a Blue-wing. This assurance, however, was happily substantiated by Mr. Richard M. Marble, to whom I had mentioned the occurrence, who, visiting the locality on June 19 and again on July 2, both times found the bird singing at the same spot where I had heard him on May 26. Mr. Marble writes me that he regrets that he did not have time to look for the nest. But the fact of a male in song being present from May 24 to July 2, a period of forty days, would indicate with reasonable certainty that once more a pair of Blue-wings had nested in this region. The locality was quite different from that of 1909, being a rather dry extent of second growth in the rear of a sandy woodlot of white pines and a variety of deciduous trees, but well supplied with undergrowth. In this woodlot we

have been accustomed to find year by year two or three Blackburnian Warblers (Dendroica fusca) singing throughout the month of May upon their arrival, and continuing in June on the testimony of other observers, giving assurance that the Blackburnian is a resident bird in this wood. The Blue-headed Vireo (Lanivireo solitarius solitarius) is also found year by year singing there much beyond the time of its migration. Both of these species were represented in song on May 24, June 19, and July 2 of the present year. Thus was had the unusual experience of hearing a Bluewinged Warbler sing with one ear and Blackburnian Warblers with the other, as probable nesting species. If the testimony presented may be accepted as furnishing reasonably reliable evidence of a nesting of Bluewinged Warbler in this locality in 1918, it may go on record as the second authentic occurrence in this region of Massachusetts, South Sudbury having the distinction of possessing both nestings within her borders.—Horace W. Wright, Boston, Mass.

A Winter Record of Bewick's Wren from Northern Virginia.—
On my way to the cars at Falls Church, Va., the morning of February 8, 1918, I was surprised by having a Bewick's Wren (Thryomanes bewicki bewicki) fly up from the ground and alight on the top of a fence within a foot or so of my face. From the fence it flew down to a small stub where it sat for about a half minute, affording me an excellent unobstructed view at only a few feet distance, before it finally hopped under a box bush where I had to leave it. The past winter has been one of the worst in this vicinity for a number of years, with the ground covered with snow and ice from early in December until after the event recorded above. Bewick's Wren is more or less rare and local in this locality at any time but not an uncommon breeding bird some fifty miles west of here, in the Blue Ridge Mountains.— J. H. Riley, Washington, D. C.

Russet-backed Thrush (Hylocichla ustulata ustulata) in New Mexico.—Some time ago, in identifying some other specimens of the genus Hylocichla in the United States National Museum, the writer unearthed a specimen of Hylocichla ustulata ustulata from New Mexico. It is No. 130328, U. S. Nat. Mus., an adult male, taken by Dr. E. A. Mearns on May 3, 1892, about one hundred miles west of El Paso, at the so-called "Upper Corner" Monument No. 40 on the Mexican boundary line, which is in the extreme southwestern corner of Luna County, New Mexico. There is, so far as I am aware, no previous authentic record of this subspecies from the State of New Mexico.—Harry C. Oberholser, Washington, D. C.

Notes from the Vicinity of Washington, D. C.— The following notes from localities within ten miles of the Capitol seem worthy of record.

Hydrochelidon nigra surinamensis. Black Tern.— Three were seen May 3, 1917, and about a dozen May 12, 1917, over Hunting Creek,

just below Alexandria, Virginia. As far as I am aware, this is the first time Black Terns have been seen in this vicinity in spring, though there are several autumn records.

Botaurus lentiginosus. American Bittern.—One was seen near Dyke, Virginia, on May 2, 1918. The latest previous spring record of which I am cognizant is April 30, 1859.

Spinus pinus. PINE SISKIN.— Two flocks containing about 35 individuals were seen October 22, 1916, above Cabin John, Maryland. Fall records of Siskins seem to be rare, and this is two days earlier than any previously recorded. Throughout the autumn of that year Siskins were quite common.

Passerherbulus henslowi henslowi. Henslow Sparrow.— One seen near New Alexandria, Virginia, April 1, 1917. The average date of arrival for this species is about April 18, and the earliest previous record April 10, 1889. This record was inadvertently reported by Dr. H. C. Oberholser (Bird-Lore, XIX, page 153) as March 25.

Oporornis formosus. Kentucky Warbler.— Heard in Zoölogical Park, April 26, 1917, one day earlier than previously recorded.

Geothlypis trichas trichas. Maryland Yellow-throat.— One seen above Cabin John, Maryland, October 22, 1916. The latest previous fall record for this species is October 21, 1895.

Polioptila cærulea cærulea. Blue-gray Gnatcatcher.— On January 1, 1917, a Blue-gray Gnatcatcher was observed for some time at the Arlington Experiment Farm, Virginia. It was very active and several times uttered its characteristic squeaking note. As far as I am aware, this is the first record of the occurrence of the species near Washington in winter. Through a clerical error this occurrence was recorded by Dr. H. C. Oberholser (Bird-Lore, XIX, page 153) as January 2. The average date of spring arrival is April 7, and the earliest March 30, 1907.— M. T. Cooke, Washington, D. C.

Scarcity of Birds in the Spring Migration of 1918.— I have seen no reference, either in 'The Auk' or 'Bird-Lore,' to a general scarcity of birds this year, especially of the warblers and other small birds.

Here, the robins, grackles, starlings, and, perhaps, the thrashers, are as numerous as usual; the jays, and, perhaps, the towhees, more so. Taking the birds as a whole, however, the difference from other years may be indicated by the following figures: — best record to June 30, 104; average record to June 30, for fourteen years, 91; this year, 67.

Not only is the number of species seen notably smaller, but the number of individuals is smaller. For instance, I could count on the fingers of one hand all that I have seen of such common warblers as the Redstart, Wilson's, the Blackpoll, Black-throated Blue, Black-throated Green, Black-and-White; and the record is not much better for the Myrtle, the Yellow, and the Maryland Yellow-throat.

I might say the same thing about the Vireos, and the Flycatchers.

The testimony of every bird student with whom I have talked, either here or in Central Park, New York, is in entire harmony with my own experience.—ROBT. BARBOUR, Montclair, N. J.

Notes on Six Birds from Georgia.—Sturnus vulgaris. Starling.—A young male was shot near Savannah by Mr. Ernest Cunningham on November 11, 1917, and brought to Mr. Gilbert R. Rossignol, Jr., who preserved it and presented the specimen to me. This is the first occurrence of this bird in Georgia.

Piranga erythromelas. Scarlet Tanager.— Among a collection of birds, made near Savannah by Mr. Troup D. Perry, and which I have acquired, is a male of this species that was taken by Mr. Perry on October 14, 1906. The Scarlet Tanager is a very rare bird in the south Atlantic States particularly on or near the coast and I have yet to detect it in the autumn in South Carolina.

During the past thirty-five years that I have devoted to ornithology in South Carolina I have seen but four birds, three of which I procured, as follows: April 30, 1889, an adult male taken on Oakland plantation, Christ Church Parish; May 4, 1911, a fine adult male taken, the late Dr. Edgar A. Mearns being at my side when I shot it; May 1, 1912, a male in very high plumage, Dr. Louis B. Bishop being near me when I shot it. The other specimen was seen on April 29, 1884, on the plantation of Mr. F. W. Heyward near Oakley and about thirty odd miles from Charleston.

Vermivora pinus. Blue-winged Warbler.— Mr. Gilbert R. Rossignol, Jr., shot on September 6, 1909, near Savannah, a beautiful male of this bird and presented it to me. The Blue-winged Warbler is very rare in the south Atlantic States and I have yet to see one alive.

Dendroica dominica albilora. Sycamore Warbler.— I have an adult male of this western form of *D. dominica* taken by Mr. D. V. Hembree at Roswell, Ga. (near Atlanta), on July 2, 1913. This bird was from the collection of Mr. Troup D. Perry and labeled by Mr. Hembree "Yellow-throated Warbler." The superciliary stripe is almost immaculate white, there being the faintest tinge of yellow when placed under a magnifying glass. This bird is in high plumage and the yellow of throat intense and hence not faded, and without doubt was mated and raised a brood of young at Roswell for the date on which it was taken was too early for a migrant from some other region, as birds do not migrate in the autumn, that is land birds, until they have renewed their plumage — and this one had not done so.

Thryomanes bewicki bewicki. Bewick's Wren.—Mr. Perry shot near Savannah on March 19, 1909, a fine male Bewick's Wren, which is the only one he has ever seen during all the years he has been observing birds near his home in Savannah. This specimen is now in my collection. Bewick's Wren is a bird of the Upper Austral Zone during the breeding season in North and South Carolina as well as Georgia, and it is resident even in the mountains of North Carolina where I have seen and heard it

sing during the coldest winters. That a few migrate to the coast of South Carolina and Georgia at times is evinced by the capture of one by Mr. Herbert Ravenel Sass at the Navy Yard, Charleston, on October 17, 1907, and by the writer seeing one near his home on October 16, 1907. (See Bull. Chas. Mus. III, 1907, 54; and Auk, XXV, 1908, 87.)

Hylocichla alicise bicknelli. Bicknelli's Thrush.— In the collection of birds received from Mr. Perry there is a very small specimen of this race that is wrongly labeled by him "Olive B.[acked] Thrush." Although the sex was not determined it is doubtless a female, and was taken at Savannah by him on May 16, 1910. There is a malformation of the maxilla which is very nearly a quarter of an inch shorter than the mandible. Upon comparing this bird with specimens of aliciæ from South Carolina, in which both males and females are represented, Mr. Perry's bird is an inch smaller in length than any female I have and the "make up" of the bird is much lengthened. Bicknell's Thrush is a rare bird in South Carolina, and I have taken but a single individual on May 10, 1900. How this bird manages to reach its breeding grounds in the Catskills and Nova Scotia without passing through South Carolina, is a puzzle.—Arthur T. Wayne, Mt. Pleasant, S. C.

#### RECENT LITERATURE.

Dwight's Review of the Juncos.—Dr. Dwight, in the brochure before us, has contributed to ornithological literature a philosophical discussion of a high order. His paper is most welcome not only because we have too few of like character, but also because of the amount of painstaking study and deep thought that this especial treatise represents.

The paper may be considered under two heads, (1) as a systematic arrangement of the species and subspecies of the genus Junco, and (2) as an attempt to define by criteria the species, subspecies and hybrid.

The results from a systematic point of view may conveniently be compared with those of Mr. Robert Ridgway's study of the same group. Comparison with the A. O. U. 'Check-List' is hardly necessary since it is no secret that the arrangement of the genus there adopted was in the nature of a compromise and represented no detailed original research. Comparing, therefore, the species and races recognized respectively by Dwight and Ridgway and the names employed by them we find that each

<sup>&</sup>lt;sup>1</sup>The Geographic Distribution of Color and of other variable Characters in the Genus Junco: a new Aspect of specific and subspecific Values. By Jonathan Dwight, M. D. Bull. Amer. Mus. Nat. Hist., Vol. XXXVIII, Art. IX, pp. 269-309. June 1, 1918.

distinguishes nineteen kinds of Juncos, although two of these, montanus and dorsalis, regarded as species by Ridgway, are considered to be hybrids by Dwight and therefore unworthy of formal recognition in his scheme. In the other forms the names employed are identical in thirteen cases and in three of the remaining four they differ only in being treated as subspecies by Dwight and as full species by Ridgway. The other form shufeldti of Ridgway is renamed couesi by Dwight on the rather questionable claim that the type specimen of shufeldti is a winter straggler of oreganus.

That Mr. Ridgway, always a "liberal" in the matter of geographic races, and Dr. Dwight, a pronounced "conservative" in systematic work, should come to such substantial agreement is doubly gratifying because it was unexpected, and we have the satisfaction of feeling that the arrangement of the Juncos is substantially settled. Viewed from the second standpoint Dr. Dwight's paper opens up a wide field for discussion. Years ago in 'Science' Drs. C. Hart Merriam and J. A. Allen engaged in a lengthy discussion on the relative values of intergradation and degree of difference in the designation of species and subspecies. Whether we are any nearer to a solution of the problem now than we were then or whether the determination of what is a subspecies and what is a species can, from the very nature of the case, ever be anything but a matter of individual opinion is a question.

Dr. Dwight lays down the law that "The species is the unit; the subspecies is part of the unit; and the hybrid is an individual that is part of two units," and again states that: "a species has one or more intrinsic characters or a combination of characters not shared by another species. The characters are qualitative," while "a subspecies shares all the characters of its parent species in greater or less degree. The characters are quantitative and without a break in the continuity."

This is all very well but would we not be quite as justified in saying that the subspecies is the unit and that the species is an assemblage of subspecies having certain characters in common? Furthermore how are we always to distinguish between qualitative and quantitative characters? We must all admit that a species in the course of evolution is derived from a subspecies and we must therefore necessarily find all intermediate stages in the change from quantitative to qualitative characters and in deciding where to draw the line we are confronted by the same old problem which is bound to bring in personal opinion. Dr. Dwight is apparently endeavoring to devise a method of naming specimens from the characters which they present and no doubt intentionally he discards so far as possible the geographic problems involved — isolation, intergradation, environment etc. This it seems to the reviewer we cannot do. We are naming forms which are the result of evolution and are bound to consider every factor involved. We necessarily find species and subspecies differing from one another by every conceivable degree of difference and no set of criteria will serve as a rule by which everyone can decide which forms are species, which subspecies and which are not worthy of recognition at all. We cannot solve

such a problem by mathematical rules or with mathematical accuracy because systematic zoology is of necessity not an exact science.

To take an example from another group we wonder how Dr. Dwight would arrange the smaller Thrushes according to the criteria which he has laid down. Could not the differences between the Olive-backed and Gravcheeked Thrushes be regarded as quantitative or qualitative according to the viewpoint of the individual? As a matter of fact the Gray-cheek was regarded as a subspecies of the Olive-back until it was found that forms of the two bred side by side without intergradation. In this connection it is interesting to note Dr. Frank M. Chapman's method of handling the subspecies problem in his recent work on the birds of Colombia. He says; "To lay down a certain rule and blindly be governed by it, is to handicap one's discrimination and experience. . . . The degree, and particularly the character of the differences exhibited, range, environment, faunal areas, the relative plasticity of the species in question, the action of other organisms in the regions concerned under similar circumstances, these and other factors, such as habits, voice etc., are to be considered in reaching a conclusion regarding the status of any form."

In this discussion we would not be understood as reflecting upon the excellent work that Dr. Dwight has done on the Juncos with the results of which we are in substantial accord. Furthermore we have always believed (cf. The Condor, March, 1903) that a plan might be devised — an arbitrary consensus of opinion if need be — by which a long series of races widely divergent at the extremes of the series but all apparently intergrading, could be broken up into specific groups, while forms widely separated geographically but differing very slightly from one another could be regarded as subspecies. A happy compromise as it were between the 'degree of difference' principle and that of 'geographic intergradation' which would vastly enhance the meaning which our names are supposed to convey. This is apparently just what Dr. Dwight is striving for but that any set of rules can be laid down by which anyone may determine the proper rank of a given form seems from the very nature of the case impossible.

One point that Dr. Dwight brings up in connection with his discussion of the race of Junco oreganus deserves special consideration. At a single locality within the range of J. o. thurberi he finds some breeding specimens which would on color alone be better referred to J. o. oregonus and J. o. couesi and he contends that if we are naming the birds and not the locality, these specimens should bear the names of these races rather than that of the race to which the vast majority of the individuals at that locality belong. Here our author is disregarding everything but color. It is a foregone conclusion that all the breeding birds at this locality belong to the same stock and should bear the same name with a comment if need be on aberrant characters. They are simply evidence of that intergradation of the three forms which shows them to be subspecies. This intergradation may be found in the area where the breeding ranges join, in which case it is manifest in a majority of the individuals, or it may be found in a large

series well within the range of any one of the races, where it will be manifest in only a few individuals. The serious point is that migrating or winter individuals are often recorded as representatives of races not normally to be found in the locality in which they are taken, whereas as Dr. Dwight shows they may very likely be merely aberrant examples of the race regularly occurring there — individuals such as we have been discussing. Such records in the case of slightly differentiated races had better not have been published no matter how experienced the authority who has identified them, and they should be given very slight attention in connection with questions of distribution or migration.

In discussing this matter Dr. Dwight in order to emphasize his points makes use of two provisional names 'cismontanus' and 'transmontanus' which cannot according to our code of nomenclature be construed in any other way but as new names which will become synonyms respectively of Junco hyemalis hyemalis and J. oreganus couesi although there is no knowing when they may come in for serious consideration should it be deemed desirable to erect other races or should one of the above names become invalid. They will then form bad stumbling blocks for the systematist as no types or type localities are mentioned. Dr. Dwight departs from the rules of nomenclature too when he emends Townsend's name oreganus into oregonus for which there seems no excuse since Oregan was the spelling generally used in Townsend's time.— W. S.

Soper on the Birds of Edmonton. — Mr. Soper has prepared a briefly annotated list of 143 species found in the vicinity of Edmonton, Alberta, based upon his observations during the years 1912 to 1914 together with such notes on the region as occur in Macoun's 'Catalogue of Canadian Birds.' The whole makes a useful and apparently pretty complete list for the locality. In commenting upon the character of the bird life the author calls attention to the fact that Edmonton is in the same latitude as southern Labrador and Ungava although its climate compares favorably with that of southern Ontario which accounts for the presence of many birds which would hardly be expected at such a high latitude.— W. S.

Wood on the Birds of Alger County, Michigan.<sup>2</sup>— To further the work of the University of Michigan's zoölogical explorations in the Upper Peninsula, Mr. George Shiras, 3rd., placed his summer home in Alger County at its disposal as a field headquarters and the present paper comprises a list of 120 species of birds observed there by Mr. Wood during a residence, from May 24 to July 27, 1916. The list is briefly annotated and some previous observations of Mr. Shiras are included.— W. S.

<sup>&</sup>lt;sup>1</sup>The Birds of Edmonton. By J. Dewey Soper. The Ottawa Naturalist, February and March, 1918. pp. 129-134 and 145-149.

<sup>&</sup>lt;sup>2</sup> Notes on the Birds of Alger County, Michigan. By Norman A. Wood. Occasional Papers, Mus. Zool. Univ. of Mich., No. 50, April 8, 1918. pp. 1-15.

Bangs on New South American Birds.— In a review of the races of Tangara gyroloides Mr. Bangs describes as new T. g. nupera (p. 76) the form found in western Ecuador, formerly considered identical with the T. g. bangsi ranging from Costa Rica to Veragua. In conjunction with Mr. G. K. Noble he has described a new woodpecker, Chrysoptilus atricollis lymani (p. 85) from Huancabamba, Peru.— W. S.

Wetmore on Duck Sickness in Utah.<sup>2</sup>—The present bulletin is a final report upon the investigations conducted by Mr. Wetmore on behalf of the U. S. Biological Survey in the vicinity of Great Salt Lake, where the mortality among water fowl has been particularly noticeable. A preliminary report was issued in 1915 and reviewed in 'The Auk' for October of that year. The present paper while going into the subject in much greater detail confirms the conclusions set forth in the preliminary report that the trouble was due to the water becoming charged with alkali. Certain salts contained in it, notably chlorides of calcium and magnesium, have been shown by actual experiment to produce the duck sickness.

The way in which the birds become infected is described by Mr. Wetmore as follows. Irrigation has decreased the amount of water supplying the marshes on the lake front, and the resulting slow drainage induces stagnation over large areas. Surface evaporation and capillary attraction rapidly draw the salts held in solution in the mud to the surface and there concentrate them. Strong winds bank up the water in the larger bays and blow it over the drying flats taking up the salts in solution and carrying with it quantities of seeds and insects upon which the ducks feed eagerly taking in naturally quite an amount of the salts. Complete draining of affected areas, increase in the supply of fresh water and caring for the sick birds, which can in a large percentage of cases be brought back to perfect health, are recommended as means to counteract the trouble.

Mr. Wetmore has done an admirable piece of work in seeking out the cause of this malady which has become a serious menace to ducks in Utah as well as in regions to the south where these birds would naturally go in the winter season.— W. S.

Mathews' 'Birds of Australia. — Part II of Volume VII of Mr. Mathew's work is a bulky number dealing with the Kingfishers and the Bee-eater, eight species being figured. As was to be expected the composite genus Halcyon comes in for some serious treatment at the author's

<sup>&</sup>lt;sup>1</sup> Notes on the Geographical Races of *Tangara gyroloides*. By Outram Bangs. Proc. N. E. Zool. Club, VI, pp. 73–76, December 21, 1917.

Description of a New Woodpecker from Peru. By Outram Bangs and G. K. Noble. Proc. N. E. Zool. Club. vi, pp. 85–86. June 7, 1918.

<sup>&</sup>lt;sup>2</sup> The Duck Sickness in Utah. By Alexander Wetmore. Bulletin 672, U. S. Department of Agriculture, June 21, 1918. pp. 1-25.

<sup>&</sup>lt;sup>3</sup> The Birds of Australia. By Gregory M. Mathews. Part II, Volume VII. May 15, 1918.

hands and some twenty pages are devoted to a history of the nomenclature of the group and the relationship of the species. No less than fourteen new genera of Kingfishers are proposed so that with those previously available every really distinct species must now be provided with a generic name. It is not for us to criticise Mr. Mathews' work for upon the standards now prevailing in other families, this subdivision is apparently perfectly justifiable if one desires to be consistent, but it only goes to prove that the utility of the generic name is being reduced to nil and it would seem that the time is not far distant when we must begin the reverse process of grouping 'natural genera' together into 'genera de convenience' if the first term of our technical names is to mean anything more than the second. The more we use generic nomenclature to designate facts in differentiation the less use it becomes as a means of indicating to some one else what we are talking about.

In the discussion of Syma torotoro three new subspecies are described from New Guinea while one new race of Dacelo leachii from Australia and one from New Guinea are described. Monarchalcyon cyanocephalus Sharpe is renamed Dacelalcyon confusus.— W. S.

Grinnell on the Name of the American Barn Swallow.1- Dr. Grinnell has brought up in this note a matter of no little importance. The Barn Swallow was originally described as Hirundo erythrogaster. In the first edition of the A. O. U. 'Check-List' it appears as Chelidon erythrogaster although Dr. Stejneger in referring it to this genus had written it erythrogastra. In the second edition where it is still referred to Chelidon and in the third where it is put back into Hirundo the feminized form erythrogastra is used. Recently Dr. Oberholser has claimed that the proper feminine of gaster is gastris and writes it erythrogastris and finally comes Dr. Grinnell with the explanation that the word is not an adjective at all but a noun and therefore should retain its original form erythrogaster under all circumstances. He seems to be absolutely right and the action of the original A. O. U. Committee should be upheld. In spite of all this Dr. Elliot Coues always employed erythrogastra and in commenting upon the form Chelidon erythrogaster said "wrong for genus and wrong for gender." It would be interesting to know what his argument in the case would be. It is perhaps one where even Latin experts will disagree.

A glance at the index to Sharpe's 'Hand-List of Birds' shows many discrepancies in handling such cases. Both *-gaster* and *-gastra* are used with feminine genera, *-venter* with both masculine and neuter and *-ventris* with masculine and feminine. So there seems much to correct no matter what view we adopt. Drs. Grinnell and Oberholser have apparently discovered another 'mare's nest' for the nomenclatorist. — W. S.

<sup>&</sup>lt;sup>1</sup> The Name of the American Barn Swallow. By J. Grinnell. The Condor, XX, p. 92, March 19, 1918.

Nichols on Some Aspects of Migration.1— Those who are interested in speculating upon the origin of bird migration will find much food for thought in this short article of Mr. Nichols. Referring to the irregular southward migrations of the Red-breasted Nuthatch and other species of similar habit, he advances the theory that these movements are the result of a great increase in abundance within the permanent range of the species from which it then sweeps outward as it were in waves. We have all noticed how few Nuthatches return northward in the spring following an enormous autumn flight and Mr. Nichols explains this by the suggestion that the bulk of them are utterly dissipated and lost, and that only a small minority ever find there way back to their permanent range. This type of migration he terms 'centrifugal,' and considers it to be the original condition. Next comes the condition where the species has become so adjusted to conditions as to maintain itself in unvarying though comparatively small numbers, here there is overcrowding and consequently no migration at all. Then come species that retire from one part of their range to another during winter but never leave it entirely, simply adjusting themselves to changed conditions; this is 'intraspecific' migration; and finally an extension of this condition where the winter and summer ranges become entirely separated and the passage from one to the other constitutes the 'centripetal' migration so familiar in our spring and fall migrants where "highly developed homing instincts in the individual bird take the place of the futile centrifugal 'wanderlust' of the race in its initial condition."

The irregular movements of the Red-bellied Nuthatch and similar species have always been a puzzle to students of migration and the failure of food supply in their regular range never appealed to the reviewer as an adequate explanation. Mr. Nichols' theory on the other hand has much to commend it.

While his last three conditions and the development one from the other have been pretty generally recognized and will be generally accepted we do not think that he has been very happy in the selection of the White-breasted Nuthatch as an example of an absolutely resident species that does not migrate at all. Certainly in many places familiar to the reviewer it is much more abundant in autumn and winter than at other seasons. It may indeed be difficult to find a species in which there is not some migratory movement within its range.— W. S.

Birds of the National Parks.<sup>2</sup>— Three of the National Park 'Circulars of Information' for 1918 — those for Glacier, Sequoia, and Yellowstone

<sup>&</sup>lt;sup>1</sup> An Aspect of the Relation between Abundance, Migration and Range in Birds. By J. T. Nichols. Science, August 16, 1918. pp. 168–170.

<sup>&</sup>lt;sup>2</sup> General Information regarding Glacier Park, season of 1918 (birds, pp. 52-64); Ibid., Sequoia and General Grant National Parks (birds, pp. 20-27); Ibid., Yellowstone National Park (birds, pp. 61-66). National Park Service, Department of the Interior. Free on application to the Director of the National Park Service, Washington, D. C.

National Parks - contain lists of birds. The list for Glacier Park, Mont., published this year for the first time is by Mrs. Florence Merriam Bailey and consists of brief notes on 184 species. Lack of space made it necessary to condense the statements as much as possible and consequently less than half a dozen lines are devoted to any one species. The list for Sequoia Park, Calif., including also the neighboring General Grant Park was prepared by the Superintendent, Walter Fry, and has been published each year since 1912. It contains 182 species but only about 50 of them are marked with an asterisk to indicate presence in General Grant Park. Evidently much more work remains to be done on the birds of this park. Moreover the notes are less than a line in length and are confined to mere statements of the status of each bird as "common resident' etc. The list for the Yellowstone Park, Wyo., is the work of M. P. Skinner and appears under his name for the first time, having been published anonymously in 1915, 1916 and 1917. It contains 194 species but the notes like those of the Sequoia list state merely whether the species are residents, summer residents, migrants, or occasional visitants. More space should be given such lists so that notes of local interest can be included and exact dates and localities given for species which occur irregularly or only occasionally.

When it is recalled that Glacier Park is larger than the state of Rhode Island, that the Yellowstone Park is two thirds the size of Connecticut, and that these reservations are visited by thousands of tourists every year, the importance of having complete and accurate lists of the birds can hardly be overestimated. Similar lists should be published at an early date for several of the other parks especially Crater Lake, Mount Rainier, Rocky Mountain and Yosemite.— T. S. P.

Economic Ornithology in Recent Entomological Publications.— A decrease in items includable under this heading is apparent and the present fasciculus or papers noted is the whole fruit of more than six months waiting. The articles relate to:

The Rhinoceros beetle (Oryctes rhinoceros). This species kills annually something more than one percent of the coconut trees of the Philippine Islands entailing a yearly money loss of nearly three million dollars. The natural enemies are few but among them are two birds, the Philippine Crow (Corone filipina) and the common roller (Eurystomus orientalis). Adults of the Rhinoceros beetles are of heavy build and from one and one half to two inches in length and the larve are even larger. It is to be inferred therefore that the large size of the insect is an important factor in limiting the number of its predatory enemies.

The round-headed apple-tree borer (Saperda candida). In the Ozark region of Arkansas whole apple orchards have been abandoned because of the destruction of trees by this pest. A single individual of the species

<sup>&</sup>lt;sup>1</sup> Mackie, D. B. Oryctes rhinoceros in the Philippines. Philippine Agr. Rev. Vol. X<sub>i</sub>. Fourth Quarter 1917, p. 326.

can kill a small tree and if two or three are present they are almost certain to cause death. The author of an extensive bulletin on this pest, states that he has seen evidences that woodpeckers prey upon the species in Ozark orchards, and that other natural enemies are few.¹ Other entomologists have testified to the value of woodpeckers in destroying larvæ of various species of Saperda, but it will be well also to draw attention to the fact that other birds feed upon adult Saperda and are of some value in keeping the species in check. These birds, so far as known, include the Magpie, Bluejay, Cassin's Kingbird, Red-eyed Vireo and Robin.

The southern corn rootworm (Diabrotica duodecimpunctata). This abundant flower beetle is the most familiar black-spotted yellow beetle over the whole United States. It is seriously destructive to corn in the southeastern states, its ravages frequently necessitating replanting. Full credit is given to its bird enemies in a Bureau of Entomology publication, but more recent information makes it possible to improve upon the account. Thirty-seven species of birds are known to feed upon this species of Diabrotica. The largest number of specimens found in the stomach of a single bird was 18 taken by a Cliff Swallow. Twenty-three species of birds are known as enemies of the southwestern rootworm, a form which although called a separate species (D. soror) probably is only varietally distinct. The Diabrotica are typical of what are called warningly colored insects and which are supposed to be more or less shielded from predatory attack. The relations of birds to them however, give little comfort to believers in this theory.

The southern green plant-bug (Nezara viridula). This insect agrees with the last discussed, in being a pest in the south, and in belonging to the category of theoretically protected insects. The basis for the latter thought is alluded to in a recent statement <sup>3</sup> about bird enemies. "In spite of the disagreeable odor of the species of the genus, the Bureau of Biological Survey has recorded finding specimens of Nezara in the stomachs of certain birds, but it appears to have been always hilaris that was found. N. viridula is probably also eaten."

Confirmation of this prophecy is now at hand as N. viridula has been identified in a number of stomachs of Franklin's Gull. From 20 to 40 specimens of the bug were taken by individual birds. The species has been found also in the stomach of Say's Phœbe. Probably many of the specimens from bird stomachs identified merely to the genus Nezara were of the species viridula for there is no reason to believe that discrimination would be shown. Thirty-one different kinds of birds are known to feed upon Nezara, further unidentified, and no fewer than 26 specimens were obtained from the stomach of a Purple Martin and 100 from a Franklin's Gull.

<sup>&</sup>lt;sup>1</sup> Becker, Geo. G. Bull. 146, Ark. Agr. Exp. Sta., July 1918, p. 25.

<sup>&</sup>lt;sup>2</sup> Luginbill, Philip. The southern corn rootworm and farm practices to control it. Farmers' Bull. 950, U. S. Dept. Agr., May 1918, p. 8.

<sup>&</sup>lt;sup>3</sup> Jones, Thos. H. The southern green plant-bug. Bull. 689, U. S. Dept. Agr., July 30, 1918, p. 21.

White grubs (*Lachnosterna* spp.). The award to birds of first place among natural enemies of white grubs, cited in 'The Auk' (Vol. 30, No. 4, Oct., 1913, p. 602) is repeated in a revision of the bulletin <sup>1</sup> there quoted. Added information is to the effect that: "The U. S. Biological Survey has found these insects in the stomachs of 78 species of birds and 2 species of toads.

Insects that carry stock diseases. The writer cannot forbear to add another to the contributions he has made to the discussion of the distribution of stock diseases. In the very first article on the subject,<sup>2</sup> the statement was made, regarding anthrax, that "The fact that the disease may be carried by flies is more than sufficient to explain the most severe epidemics" (p. 298). The author of one of the papers reviewed at that time now has published the results of further experimentation and reports the positive findings that the horn fly, horse flies and mosquitos are capable of transmitting anthrax by feeding upon a healthy animal after biting an infected one. In the face of such evidence, of which much was available years ago, the waging of a severe campaign against Turkey Buzzards as the most important carriers of stock diseases, is a deplorable example of popular disregard of scientific teachings.— W. L. M.

Centurus radiolatus in relation to Cocoa in Jamaica.— The Jamaica Woodpecker has been the subject of many complaints of doing damage to cocoa pods. The matter has been investigated by Mr. A. H. Ritchie, Government Entomologist, and his report has recently been published. By stomach analysis and field observation he finds that the normal food of the bird is fruit pulp, seeds and insects. Most of these items were specifically identified and lists of the names are given. Mr. Ritchie found no direct evidence of damage to cocoa, a conclusion supported by letters reproduced in the previous issue of the Journal (22, No. 2, February, 1918, pp. 65–69). Two or three writers state that they have long had standing rewards for woodpeckers with remains of cocoa pods or seeds in their crops, but have never had a bird presented. One of these writers also gives a number of stomach analyses. The investigation so far as it has proceeded, is clearly in favor of the Jamaica Woodpecker and the burden of proof of damage done rests upon the accusers.— W. L. M.

Further Notes on Possible Avian Distribution of Hog Cholera.— The full report of the experimental investigations of the distribution of hog

<sup>&</sup>lt;sup>1</sup> Davis, J. J. Common White Grubs. Farmers' Bull. 940, U. S. Dept. Agr., May, 1918,

<sup>&</sup>lt;sup>3</sup> The Auk, 30, No. 2, April, 1913, pp. 295–8. Succeeding articles are in Vol. 35, No. 2, April 1918, pp. 253–4 and in Farmers' Bull. 755, U. S. Dept. Agr., Oct. 26, 1916, pp. 37–9,

<sup>&</sup>lt;sup>3</sup> Morris, Harry. Blood-sucking Insects as Transmitters of Anthrax or Charbon. Bull. 163, La. Agr. Exp. Sta., March 1918, p. 15.

<sup>&</sup>lt;sup>4</sup> Journ. Jamaica Agr. Soc. 22, No. 3, March 1918, pp. 102-107. Issued separately and repaged 1-6.

cholera by pigeons, that was noticed in the last issue of 'The Auk,' has now been published.' No further comment on the experiments is necessary except to state that the conditions were exceedingly severe and that the authors would have been justified in concluding that pigeons, and any other birds of similar habits, probably never are concerned in the spread of hog cholera.

Other experiments reported on in the same publication (pp. 102-115) are of interest in connection with the study of carrion feeders as distributors of the disease. One of the findings is that "fresh collected secretions and excreta [of the hogs] proved to be non-infectious when fed," with one possible exception. This disposes of one theory to the effect that buzzards may get the virus from hog droppings and distribute it. It was also shown that the flesh of rats which were fed on the meat of cholera hogs for periods up to three weeks was non-infectious when fed to susceptible animals. These findings, if of general application, so narrow the possibilities of transmission of hog cholera by carrion feeders, that there is no doubt a great mistake has been made in pronouncing buzzards guilty and even condemning them by statute, in advance of thorough and careful investigation of their relation to stock diseases.— W. L. M.

Recent Publications on Economic Ornithology.— The Biological Survey of the U. S. Department of Agriculture has issued its usual 'Directory of Officials and Organizations Concerned with the Protection of Birds and Game,' <sup>3</sup> compiled this year by W. F. Bancroft, while another pamphlet <sup>4</sup> described under 'Notes and News' deals with the Migratory Bird Treaty and its Regulations. Bulletin 715 <sup>5</sup> of the same Department, by W. L. McAtee is entitled 'Attracting Birds to Public and Semipublic Reservations' and should be in the hands of all park superintendents, as well as those in charge of cemeteries, school grounds, etc. County road supervisors too could learn a valuable lesson from its perusal.

From 'Bird Notes and News' we learn of the increase of insect pests in England owing to the abnormally large areas under cultivation and the decrease in the number of insectivorous birds during severe weather, a condition which brings forth strenuous appeals for the better protection of birds. On the other hand the War Agricultural Committees are advocating the total destruction of the Rooks which are however, known to be at certain seasons very beneficial, and much opposition to the order is manifested.

Mr. Oldys' 'Current Items of Interest' 6 'The Bluebird' 7 and the

<sup>1</sup> Vol. 35, No. 2, April 1918, pp. 253-4.

<sup>&</sup>lt;sup>2</sup> Journ. Agr. Research, Vol. 13, No. 2, April 8, 1918, pp. 125-129.

<sup>3</sup> Issued August 19, 1918.

Issued August 26, 1918.

Issued August 12, 1918, price 5cts.

No. 37, June 29, 1918. No. 38, July 1.

<sup>&</sup>lt;sup>7</sup> Published monthly in co-operation with the Cleveland Bird-Lovers Association, 1010 Euclid Ave., Cleveland, Ohio.

'New Jersey Audubon Bulletin' 1 present a variety of notes on economic subjects.

'The Audubon Bulletin' of the Illinois Audubon Society <sup>2</sup> has become more than a mere bird conservation publication and the Spring and Summer issue for 1918 is full of local ornithological information of permanent value, the Snowy Owl coming in for considerable attention. Migration is also discussed and Mr. Frank Smith presents data to show the direct effect of weather conditions on the arrival of birds. The late expert on this branch of ornithology, Prof. Wells W. Cooke, held exactly opposite views (see Auk, 1913, p. 205) but the reviewer is inclined to favor Mr. Smith's contention.— W. S.

### The Ornithological Journals.

Bird-Lore. XX, No. 4. July-August, 1918.

Notes on the Nesting of the Nashville Warbler. By H. E. Tuttle.

How I Mothered a Pair of Hummingbirds. By P. G. Cartlidge.

The Black-billed Cuckoo. By C. W. Leister.—Good photograph of the young.

Bird Walks. By Charles B. Floyd.—Brookline, Mass. Bird Club. Spotted Sandpiper Colonies. By J. W. Lippincott.—Six nests in close proximity in one locality and three in another.

The Shrikes form the subject of the notes on migration and plumage with a colored plate by Fuertes.

The Condor. XX, No. 4. July-August, 1918.

Notes on the Nesting of the Redpoll. By Lee R. Dice.— On the north fork of the Kuskokwim River, Alaska.

A Return to the Dakota Lake Region. By Florence M. Bailey.— (Continued.)

The Yolla Bolly Fox Sparrow. By Joseph Mailliard—Passerella iliaca brevicauda (p. 139) subsp. nov., Yolla Bolly Mts., Trinity and Tehama Counties, California.

The Wilson Bulletin. XXX, No. 2,. June, 1918.

A Hummingbird's Favorite Nesting Place. By F. N. Shankland.

A Second Bird Survey at Washington, D. C. By Harry C. Oberholser.—Seventeen parties saw in all 166 species and 17,074 individuals. Dr. Oberholser uses his own nomenclature instead of that of the A. O. U. Check-List and as only technical names are used a number of them are meaningless to the general reader.

Some Florida Herons. By John Williams.

Birds Observed near Minco, Central Oklahoma. By Alexander Wetmore.— (Continued.)

The Oologist. XXXV, No. 7. July 1, 1918.

<sup>&</sup>lt;sup>1</sup> No. 26, July, 1918.

<sup>2 1649</sup> Otis Building, Chicago, Ill.

Contains excellent photographs of a live Trumpeter Swan and the nest of a Dipper.

In a list of exceptionally large and other unusual sets Mr. R. M. Barnes gives a list of species in the nests of which he has found eggs of the Cowbird.

The Ibis. X Series, VI, No. 3. July, 1918.

Remarks on Hawks of the Genus Micrastur. By W. L. Sclater. With colored plate of the recently described M. plumbeus Sclater.

Ornithological and Oological Notes from the River Somme Valley at its mouth and near Peronne. By Major W. M. Congreve.

Further Ornithological Notes from the Neighborhood of Cape San Antonio, Province of Buenos Ayres. Part I. Passeres. By Ernest Gibson.—A valuable account in the form of a fully annotated list by a resident of the country for over forty years, with an interesting descriptive and historical preface.

A List of the Birds of the Anglo-Egyptian Sudan, based on the Collections of Mr. A. L. Butler, Mr. A. Chapman and Capt. H. Lynes and Major C. Cristy. By W. L. Sclater and C. Mackworth-Praed. Part I, Corvidæ-Fringillidæ. This is an important technical paper as might be inferred from the wealth of material upon which it is based. In the course of their critical studies the authors have had occasion to describe several new forms both from the Sudan and from adjoining regions. We note the following: Estrilda astrild gaboonensis (p. 443), new name for E. rubriventris Sharpe and Shelley, (nec Vieill.), Anomalospiza butleri (p. 460) Lado Enclave; Serinus mozambicus tando (p. 465), North Angola; S. m. aurifrons (p. 466) Sennar.

Further Notes on Birds Observed at Alix, Buffalo Lake, and Red Deer in the Province of Alberta, Canada, in 1915 and 1916. By Charles B. Horsbrugh.

Bulletin of the British Ornithologists' Club. No. CCXXXIV. May 22, 1918.

Dr. Hartert described as new Dicaum trigonostigma megastoma (p. 74), Natuna Isls.; D. t. flaviclunis (p. 75), Java.

Bulletin of the British Ornithologists' Club. No. CCXXXV. July 25, 1918.

The following new forms were described: By Lord Rothschild; Lioptilus abyssinicus ansorgei (p. 78) Mucuio, Benguella; by Dr. Hartert, Phanicurus frontalis sina (p. 78), Kansu, China; by Mr. Charles Chubb, Myrmophila vavasouri (p. 83), Ituribisi River, British Guiana; Rhopias spodionota juninensis (p. 84), Junin, Peru; Cercomacra cinerascens immaculata (p. 84), Supenaam River, British Guiana; C. tyrannina saturatior (p. 85), Ituribisi River, British Guiana; C. t. pallescens (p. 85), Esmeraldas, Ecuador; Rhopoterpe torquata equatorialis (p. 85), Sarayacu, E. Ecuador; Hylopezas macularia macconelli (p. 86), Ituribisi River, British Guiana; Grallaricula nana kukenamensis (p. 86), Kukenam Mts., British Guiana; Furnarius leucopus hauxwelli (p. 87), Pebas, Peru; and Lochmias nematura castanonota (p. 87), Kukenam Mts., British Guiana.

British Birds. XII, No. 1. June, 1918.

Some New Facts about Grit. By Dugald Macintyre.—Sometimes ejected in castings, sometimes in droppings. Retention in the stomach determined by its condition, whether sharp or worn. Curlew eject the whole lining of the stomach with the grit inside, in autumn.

The Moults and Sequence of Plumages of the British Waders. Part VI. By Annie C. Jackson.

Bird Notes from Macedonia. By J. M. Harrison.

British Birds. XII, No. 2. July, 1918.

The Effect of the Winter of 1916-1917 on our Resident Birds. By Rev. F. R. C. Jourdain and H. F. Witherby. Part II.

The Moults and Sequence of Plumages of the British Waders. Part VII. By Annie C. Jackson.

British Birds. XII, No. 3. August, 1918.

The First Nesting Record of the Great Skua in the Orkneys. By Rev. F. R. C. Jourdain.

Heather and Grouse Disease. By Dugald Macintyre.— Considers climatic conditions, which cause a blight in the heather, the fundamental cause of 'grouse disease' although the immediate cause may be, as the grouse disease Commission reported, the presence of internal parasites.

Some Breeding Habits of the Sparrow Hawk. No. 6. By J. H. Owen.— Laying and Incubation.

Avicultural Magazine. IX. No. 7. May, 1918.

Nesting of the Long-eared Owl on the Ground. By J. H. Gurney.

Avicultural Magazine. IX, No. 9. July, 1918.

Puffins on the Saltee Islands. By G. E. Low.—With an interesting photograph of the colony.

The Austral Avian Record. Vol. III, No. 6. June 25, 1918.

Alfred John North, Ornithologist: An Appreciation. By Gregory M. Mathews.— With portrait.

On Pachycephala melanura Gould. By Gregory M. Mathews.

On Turdus maxillaris Latham. By Gregory M. Mathews.— The specific name as applied to the Australian Sphecotheres is rejected as Mr. Mathews considers that the Watling plate, here reproduced, cannot represent this bird which therefore becomes S. vieilloti Vig. and Horsf. The genus he would remove from the Oriolida to the Campophagida following Pycraft. The species S. stalkeri he thinks must have been taken in New Guinea and not in Australia as it has never since been found in the latter country.

A Forgotten Ornithologist. By Gregory M. Mathews and Tom Iredale.—
Through the courtesy of Mr. C. Davies Sherborn an apparently rare and
hitherto overlooked work by F. P. Jarocki, a Polish naturalist, is here
described and considered in relation to ornithological nomenclature. The
volume in question is the bird volume of a 'Zoologia' which was never
completed, stopping for some reason with volume six. It appeared in
1821. A number of new generic names occur in Jarocki's work of which

the following demand recognition: Phaniculus replaces Irrisor Less; Crinifer must replace Chizarhis Wagl.; Vestiaria dates from here instead of from Fleming and Remiz replaces Anthoscopus Cab.

The most serious matter so far as American ornithology is concerned is however the presence of a genus *Cardinalis* based on the Scarlet Tanager! While this becomes a synonym of *Piranga* and does not affect the names of our Tanagers it antedates Bonaparte's name *Cardinalis* for the Cardinal Grosbeak and renders it untenable.

To meet this contingency the authors propose for the Cardinal the generic name *Richmondena* (p. 145) "as our small meed of recognition of the immense work, so invaluable as to be almost incalculable, performed by our friend Dr. C. W. Richmond, and the association of the name of our brilliant co-worker in the least showy side of ornithology with the brilliant Cardinal seems a pleasing item."

Incidentally the question of the genera in Oken's list (Isis, 1817) comes up for comment and Mr. Mathews contends that all or none of them should be accepted and that the A. O. U. Committee had no right whatever to accept those which happened to be in Latin form and reject *Eider*, *Moustache*, *Souchet* and *Macreuse*. With this opinion the reviewer has always been in hearty accord.

Validity of Some Generic Terms. By Gregory M. Mathews and Tom Iredale.—This is a consideration of the Lacépède genera under which no species are mentioned. The authors call for a definite decision by the International Commission as to whether the citation of species by a subsequent author validates the name from the date of such citation or from the original date of publication, or whether the original publication should be regarded as unrecognizable and any subsequent use of the name be forbidden.

It would seem to us that the opinion of the Commission quoted by Mr. Mathews to the effect that the genus be regarded as including all the species of the world that would come under the published diagnosis covers the case. Even though the diagnoses of the four genera of Accipitres—Circus, Buteo, Astur and Milvus—are not sufficiently definite to distinguish the four groups of species involved, we can nevertheless include all the known hawks under each, if necessary, and let the next user of the names restrict each one, which is the plan followed by the A. O. U. Committee. As a matter of fact we have very few cases of this sort and the danger of encouraging carelessness in the future by giving any recognition to such names is negligible.

South Australian Ornithologist. III, Part 6. April, 1918.

A Trip on the Coorong and Amongst the Bristle Birds on Younghusband Peninsula. By S. A. White.

A Sketch of the Life of Samuel White. By S. A. White.— An interesting biography continued in the July issue.

South Australian Ornithologist. III, Part 7. July, 1918.

A Visit to the Breeding Grounds of Swan and Pelican on the Coorong. By S. A. White.

Some Observations on the Nesting and the Young of Cormorants. By A. N. Morgan.

Revue Française d'Ornithologie. X, No. 108. April 7, 1918. [In French.]

An Apparent Hybrid between the Pigeon and Dove. By X. Raspail.

Revue Française d'Ornithologie. No. 109. May 7, 1918.

Birds of the Valley of the Ancre during the Winter of 1916-1917. By Capt. J. N. Kennedy.

On a Small Collection of Birds from the Belgian Congo. By A. Menegaux and Van Saceghem.— Continued in the next issue.

Revue Française d'Ornithologie. No. III. July 7, 1918.

On Color Vision and Color Sensitiveness in Birds. By R. Dubois.

Notes on the Ornithology of Tunis. By A. Blanchet.

Ardea. VII, No. 1-2. [In Dutch.]

Bird Migration Observations in Holland in 1917. By Dr. H. Ekama. Report from the Netherlands Ornithological Experiment Station at Heumen. By Jan J. Luden Van Heumen.—An eleborate analysis of the food of the Wood Pigeon (Columba palumbus) and Turtle Dove (Turtur turtur) with detailed contents of stomachs and crops and extensive charts.

## Ornithological Articles in Other Journals.1

Grinnell, Joseph. Bird Migration in its International Bearing. (The Scientific Monthly, August, 1918.)

Beebe, William. A Kashmir Barrage of Hail. (Zoölogical Society Bulletin, May, 1918.) — Contains a list of western Himalayan birds.

Crandall, Lee S. Bird Life of a Big City. (Ibid.) — Contains a list of wild birds of the New York Zoölogical Park.

Brooks, Major Allan. Brief Notes on the Prevalence of Certain Birds in British Columbia. (The Ottawa Naturalist, February, 1918.)

Criddle, Norman. Bird Notes from Manitoba. (*Ibid.*, March, 1918.)

Johnson, C. E. Mammal Food of the Great Horned Owl. (*Ibid.*, April, 1918.)

Gormley, A. L. The Evening Grosbeak at Amprior, Ont. (*Ibid.*) — Present every winter from 1912–13 to 1916–17, but absent last winter not only here but throughout eastern North America.

Saunders, W. E. A Protected Nest of the Bald Eagle. (*Ibid.*) — Nested in the same woods for the last 25 years.

Collinge, Walter E. On the Value of the Different Methods of Estimating the Stomach Contents of Wild Birds. (The Scottish Naturalist,

<sup>&</sup>lt;sup>1</sup>Some of these journals are received in exchange, others are examined in the library of the Academy of Natural Sciences of Philadelphia. The Editor is under obligations to Mr. J. A. G. Rehn for a list of ornithological articles contained in the accessions to the library from week to week.

May, 1918.) — An endorsement of the methods of the U. S. Biological Survey.

Chapman, Alfred. Notes and Observations on the Birds of North Uist in May, 1883. (Ibid., June, 1918.)

Shufeldt, R. W. Anomalies to be Found Among Ordinary Birds. (Scientific American Supplement, No. 2207.)

Wetmore, Alexander. Description of a New Subspecies of the Little Yellow Bittern from the Philippine Islands. (Proc. Biol. Soc. Wash. 31, pp. 83–84, June 29, 1918.) — Ixobrychus sinensis astrologus (p. 83) Luzon.

Hollister, N. The Yellow Rail in the District of Columbia. (*Ibid.*, p. 93, June 29, 1918.) — One captured May 20, 1917.

Zimmer, John T. Instinctive Feeding Habits of Young Herons. (*Ibid.*, p. 94.) — Young herons invariably speared fish placed in a pan of water on the first thrust and as invariably missed those placed on the floor. The refraction of light passing through the water is suggested as the reason, the birds being accustomed to take their food from shallow water aim their thrusts accordingly.

Oberholser, H. C. Aristonetta a Good Genus. (*Ibid.*, p. 98.) — In the opinion of the author this name should be revived for the Canvasback.

Oberholser, H. C. Spizilla monticola (Gmel.) the Correct Name for the North American Tree Sparrow. (*Ibid.*, p. 98.) Fringilla canadensis Bodd. has been cited as an earlier name for this bird but it proves to be based on the young of some other species, possibly the White-throated Sparrow.

Pitt, Frances. The Colour Changes of the Beak and Shield of the Young Moorhen (Gallinula c. chloropus). (Novitates Zool., XXV, No. 1, May 1918.)

Hartert, Ernst. Types of Birds in the Tring Museum. (Ibid.) — The Brehm Collection.

Hartert, Ernst. On the Genus Calandrella. (Ibid.)

Van Someren, V. G. L. A Further Contribution to the Ornithology of Uganda (West Elgon and District).— (*Ibid.*) — *Linurgus elgonensis* (p. 283) sp. nov.

Baker, E. C. Stuart. Some Notes on the Dicruridæ. (*Ibid.*) — New forms described are: *D. leucophaeus disturbans* (p. 293), Amherst, Malay Peninsula, *D. l. hopwoodi* (p. 294), Dacca, *D. l. stevensi* (p. 295), Darjeeling, India and *D. l. minimus* (p. 296), Ceylon, *D. ater harterti* (p. 299), Formosa and *D. paradiseus nicobariensis* (p. 302), Nicobars.

Hartert, Ernst. Notes on Penduline Tits. (Ibid.)

Allen, A. A. The Diurnal Birds of Prey — Hawks, Eagles and Vultures. (American Forestry, XXIV, pp. 281–284.)

Allen, A. A. The Pigeons and Doves. (Ibid., pp. 428-432.)

Allen, A. A. The True Hawks. (*Ibid.*, pp. 357-361.) Admirable popular articles with a wealth of excellent illustrations from photographs.

Oberholser, H. C. The Common Ravens of North America. (Ohio Jour. of Sci., XVIII, No. 6, April, 1918.) — Corvus corax europhilus (p.

215), type locality Alabama, is proposed for the Raven of eastern U. S. and southern Canada. *C. c. sinuatus* is limited to central U. S. and Central Mexico, and *C. c. clarionensis* extended to include birds of extreme N. W. Mexico and S. W. United States. *C. c. principalis* remains the form of the far north.

Oberholser, H. C. Diagnosis of a New Genus of Timaliidæ. (Jour. Wash. Acad. Sci., VIII, No. 12, January 19, 1918.) — Sterrhoptilus (p. 394), new genus based on Mixornis capitalis.

Baker, E. C. Stuart. The Game Birds of India, Burma and Ceylon. Pt. XXIII. (Jour. Bombay, Nat. Hist. Soc. XXV, No. 3, January 15, 1918.)

Anderson, Johannes C. New Zealand Bird-song. Further Notes. (Trans. and Proc. N. Z. Inst. XLIX, December 20, 1917.) — Claims a

similarity to human music.

De Ferris, F. Contribution to a Study of the Cries and Songs of Birds in Relation to Music. (Bull. Inst. Gen. Psychologie, XVII, No. 4-6.) [In French.]

Colthrup, C. W. Some Observations on Birds' Songs and Calls. (Wild Life X, No. 3, March 1918.)

Mullens, W. H. Bullock's London Museum. (The Museum's Journal [London], XVII, Nos. 4, 9 and 12.) — An important account of this historic museum and its collections.

Swales, B. H. The Purple Sandpiper at Cleveland, Ohio. (Occasional Papers of the Museum of Zoölogy, Univ. of Mich., No. 57, June 20, 1918.) — September 3, 1883.

Oberholser, H. C. The Criterion of Subspecific Intergradation in Vertebrate Zoölogy. (Science, August 16, 1918.) — In the course of his discussion the author says that the 'degree of difference principle' so strongly advocated by Dr. C. Hart Merriam "has been found unsatisfactory." This statement would seem to be rather too sweeping as many ornithologists of the highest standing regard as subspecies forms which differ but slightly but do not intergrade, so long as their ranges are distinct. In a very large number of cases too our judgment is actually based on the amount and character of the difference, the intergradation being inferred. As in many other evolutionary problems we shall probably ultimately consider several factors in reaching a conclusion rather than try to bind ourselves to one principle only (cf. p. 487).

Publications Received.—Bailey, Florence Merriam. Birds of Glacier National Park. (General Information regarding Glacier National Park Season of 1918, pp. 52-64.)

Bancroft, W. F. Directory of Officials and Organizations Concerned with the Protection of Birds and Game, 1918. (U. S. Department of

Agriculture, Biological Survey.)

Bangs, Outram. (1) Vertebrata from Madagascar. (Bull. Mus. Comp. Zool., LXI, No. 14, pp. 489–511.) (2) Notes on the Geographical Races of *Tangara gyroloides*. (Proc. N. E. Zool. Club, VI, pp. 73–76, December 21, 1917.)

Bangs, Outram and Noble, G. K. Description of a New Woodpecker from Peru. (Proc. N. E. Zool. Club, VI, pp. 85-86. June 7, 1918.)

Dwight, Jonathan, M. D. The Geographical Distribution of Color and of other variable Characters in the Genus Junco: a new Aspect of specific and subspecific Values. (Amer. Mus. Nat. Hist. Bull., XXXVIII, pp. 269-309. June 1, 1918.)

Grinnell, J. (1) The Name of the American Barn Swallow. (The Condor, XX, p. 92, March, 1918. (2) Seven New or Noteworthy Birds from East-Central California. (*Ibid.*, pp. 86-90.) (3) The Subspecies of the Mountain Chickadee. (Univ. of Cal. Publ. in Zool., Vol. 17, pp. 505-515. May 4, 1918.)

Hollister, N. The Yellow Rail in the District of Columbia. (Proc. Biol. Soc. Wash., Vol. 31, pp. 93, June 29, 1918.)

McAtee, W. L. Attracting Birds to Public and Semipublic Reservations. (Bull. 715, U. S. Dept. Agriculture, August 12, 1918.)

Mathews, Gregory M. The Birds of Australia. Vol. VII. Part II. May 15, 1918. London, Witherby & Co.

Nichols, J. T. An Aspect of the Relation Between Abundance, Migration and Range in Birds. (Science, XLVIII, No. 1233, August, 16, 1918.)
Shufeldt, R. W. Anomalies to Be Found Among Ordinary Birds.

(Scient. Amer. Suppl., No. 2207, April 20, 1918.)

Skinner, M. P. Birds of the Yellowstone National Park. (General Information Regarding Yellowstone National Park. Season of 1917, pp. 54-59.)

Soper, J. Dewey. The Birds of Edmonton. (Ottawa Naturalist, XXXI, Nos. 11 and 12, February and March, 1918.)

Swales, Bradshaw H. The Purple Sandpiper at Cleveland, Ohio. (Occas. Papers Mus. Zool. Univ. of Mich., No. 57, June 20, 1918.)

Swarth, H. S. The Subspecies of the Oregon Jay. (The Condor, XX, pp. 83-84, March, 1918.)

U. S. Dept. of Agriculture. Migratory Bird Treaty and Regulations. (August 26, 1918.)

Wetmore, Alexander. The Duck Sickness in Utah. (Bull. No. 672, U. S. Dept. of Agr., June 21, 1918.)

Wood, Norman A. (Occas. Papers Mus. of Zool. Univ. of Mich., No. 50, April 8, 1918. Notes on the Birds of Alger County, Michigan.)

American Museum Journal, XVIII, No. 5, May, 1918. Ardea, VII, No. 1–2.

Audubon Bulletin, Spring and Summer 1918.

Austral Avian Record, The, III, No. 6, June 25, 1918.

Avicultural Magazine, (3), IX, Nos. 8 and 9, June and July, 1918.

Bird-Lore, XX, No. 4, July-August, 1918.

Bird Notes and News, VIII, No. 2, Summer, 1918.

Bluebird, The, X, Nos. 6 and 7, May and June, 1918.

British Birds, XII, Nos. 1, 2 and 3, June-August, 1918.

Bulletin British Ornithologists' Club, Nos. CCXXXIV and CCXXXV, May 22, and July 25, 1918.

California Fish and Game, Vol. 4, No. 3, July, 1918.

Condor, The, XX, No. 4, July-August, 1918.

Current Items of Interest, Nos. 37 and 38, June 29 and July 1, 1918.

Emu, The, XVIII, Part I, July, 1918.

Fins, Feathers and Fur, No. 14, June, 1918.

Ibis, The, (10), VI, No. 3, July, 1918.

New Jersey Audubon Bulletin, No. 26, July 1, 1918.

Oölogist, The, XXXV, Nos. 7 and 8, July and August, 1918.

Ottawa Naturalist, The, XXXI, No. 12, March, 1918 and XXXII, No. 1, April, 1918.

Proceedings of the Academy of Natural Sciences of Philadelphia, LXX, Part I, 1918.

Revue Française d'Ornithologie, Nos. 108, 109, 110, 111, April-July, 1918. Science, N. S., Nos. 1225-1237.

Scottish Naturalist, The, No. 77 and 78, June, 1918.

South Australian Ornithologist, The, III, Nos. 36 and 7, April and July, 1918.

Wilson Bulletin, The, XXX, No. 2, June, 1918.

Zoological Society Bulletin, XXI, Nos. 3 and 4, May and July, 1918.

## CORRESPONDENCE.

#### Concerning a Certain Tendency in Systematic Ornithology.

EDITOR OF 'THE AUK':

The more I think of it, the more dangerous appears to me to be the stand of those few who would assign to an extreme of one subspecies or species (an individual from within the breeding range of that form as typically represented by the mean) the name of an essentially different subspecies or species which that individual happens to resemble.

To illustrate, Dr. Dwight in his recent essay on the Genus Junco (Bull. Amer. Mus. Nat. Hist., vol. XXXVIII, 1918, pp. 269-309, 5 text-figs. [maps], pls. XI-XIII), cites (p. 293) the case of a series of breeding juncos, one hundred males, all from one locality in the Sierra Nevada of central California. He finds in this series, with regard to one character, color, variations which lead him to refer about seventy-five percent (with pinkish brown backs) to thurberi, fifteen percent (with browner backs) to "couesi," and a smaller percentage (with deeply ruddy backs) to oregonus. Of course, as pointed out by him, there are further variations, and also these categories are not sharply demarked. Dwight says (p. 294): "I do not see how we can escape the necessity of calling a specimen oregonus or

thurberi, or any other name, if it shows the characters of the form, no matter where it is taken."

Do not my readers immediately see, with me, the extreme danger into which the spread of this conviction will inevitably lead our science? What will be the value of subspecific determinations by Dwight, Bishop and the others of like mind, in accurate studies of migration and of distribution in general? Can they be used at all, without incurring the risk of making wholly incorrect inductions? If such practice becomes universal, wherein could there be any further use at all for recognizing subspecies and slightly differentiated species? Would we not have to restrict ourselves to dealing with simply black-headed juncos, slate-colored juncos, and gray-headed juncos, or, safer yet, with just juncos?

The rational employment of the subspecific concept as different from the specific one requires the exercise of judgment based on experience just such as is needed in any other advanced field of knowledge. Furthermore, the essential factor involved in the use of trinomials (as designating subspecies as distinguished from species) is variation. After years of study on the part of scores of systematists in ornithology and mammalogy, there are admitted by all, I believe, but two criteria for use of the trinomial: (1) relatively small degree of difference, and (2) the fact of intergradation either through individual variation (as in insular races) or through geographical blending, where the ranges are continuous. Intergradation has always been, among the greatest number of vertebrate systematists, the basis for the use of the subspecies concept, and it should continue so to be. Now, the existence of normal fluctuational variation in two forms means that there has to be overlapping where the means are sufficiently close together; in other words, intergradation occurs, and the convergent extremes will be alike. In any case, if we take a considerable number of representatives of an animal which is subject to geographic differentiation, from one locality, and another lot from another locality, in a separate area of differentiation, and plot graphically their different characters separately, which is essentially what Dwight has done with color in the Genus Junco, we find that some of the specimens fall together, as demonstrated by him in this particular case; but who, until now, would think of calling such individuals as fall in the small area of coincidence of the polygons by other than the name of the race to which they geographically and genetically belong!

I insist, Dwight's repeated assertions to the contrary notwithstanding, that we simply *must* consider locality inhabited as one of the most important characters possessed by a species or subspecies. Otherwise, our efforts to classify specimens as to species and subspecies are liable to be worthless. From time immemorial "habitat" has been included as one of the first and most important diagnostic characters of a species. Why begin to disregard it now!

The main object of classification, from top to bottom, is to express genetic relationship, irrespective of superficial resemblances or such as may

obtain in the normal behavior of fluctuational variation. This is, as everyone knows, a formidable problem, one that is likely never to be solved to our complete satisfaction because of some of just those difficulties that Dwight complains of throughout the paper cited. But we are going to approach far closer to the ideal than the present stage—provided the work of the open-minded, painstaking yet optimistic student continues to dominate the field.

JOSEPH GRINNELL.

California Museum of Vertebrate Zoölogy, July 9, 1918.

#### A Correction.

EDITOR OF 'THE AUK':

My thanks are due to Mr. Alexander Wetmore, not alone for the pleasure, shared with other readers of 'The Auk,' in perusing his valuable contribution on 'The Birds of Desecheo Island, Porto Rico,' but also for having therein called my attention to a hitherto overlooked slip of the pen in my article 'A Day on De Cicheo Island' (Oölogist, 1900), whereby (page 117, second paragraph), I referred to the "Sooty Tern" instead of to the Noddy, as should have been the case. This error certainly requires correction, even at this late date.

Of course the character of the slip is at once apparent on referring to my paper on the 'Birds of Porto Rico' (Auk, 1902–03), wherein (1902, pages 357–358) the Sooty Tern is correctly recorded as noted only on Mona Island, the Bridled Tern and Noddy, however, having been noted on both Mona and Desecheo Islands.

B. S. BOWDISH.

Newark, N. J., July 11, 1918.

## NOTES AND NEWS.

ALL readers of 'The Auk' are familiar with the changes which are continually being proposed in the technical names of our birds and are doubtless reminded of the old saying that 'A rose by any other name will smell as sweet.' Those actively interested in nomenclature know that many of these proposed changes, as well as similar ones in other branches of zoölogy and botany, are necessary in order to conform to the rules adoped to bring about uniformity in scientific nomenclature. What strides have been made toward uniformity and stability in bird names under these rules may be realized by comparing the 'Hand-List' of the B. O. U. and the A. O. U. 'Check-List' (cf. Auk, 1915, p. 243).

Other proposed changes involving the acceptance or rejection of newly described races, subdivisions of genera etc., depend upon individual opinion and can only be decided by an authoritative list prepared by a committee of arbitration. Such a list is our A. O. U. 'Check-List' prepared by the A. O. U. Committee on Classification and Nomenclature, and the great majority of our readers who are not interested in the technicalities of nomenclature turn to this check-list when they wish to make use of scientific names.

This work can of necessity never be up to date and for the convenience of those who wish to keep up with the technicalities a series of annual lists of proposed changes and additions to the 'Check-List' appears in the April issue of 'The Auk,' compiled by Dr. Harry C. Oberholser and embodying the compiler's opinions upon certain of the cases. These lists however, carry no further authority and no action has as yet been taken by the A. O. U. Committee on any of the cases contained therein.

It seems desirable that this fact be strongly emphasized since the 'Lists' have been confused by some with the 'Supplements to the Check-List' issued under the authority of the Committee. A case in point is Mrs. Florence Merriam Bailey's excellent 'List of the Birds of Glacier National Park' which is stated to follow the '1910 A. O. U. Check-List revised to the April 1918 Auk.' As the list of proposed changes in the April 1918 'Auk' and its predecessors contain no decisions by the A. O. U. Committee it is obvious that any "revision" of the 'Check-List' based upon them is purely the selection or rejection of such names there included as the author may

While in technical papers representing original research in nomenclature it is perfectly proper for an author to propose or endorse names differing from those used in the 'Check-List,' it seems most undesirable to do so in local North American lists or in popular articles or such as are written for public instruction, as Mrs. Bailey's list above quoted or Dr. Oberholser's census of birds in the vicinity of Washington, D. C. (see antea p. 492). In the latter only technical names are used and as the average reader of the census will be unable to locate a number of them in the A. O. U. 'Check-List,' the only check-list available to him (or in any other, for that matter) he will be unable to understand what birds Dr. Oberholser is writing about. We do not question the accuracy of Dr. Oberholser's nomenclature — there are few better authorities on the subject - nor the probability that the A. O. U. Committee will ultimately endorse most of his decisions, but until they do so it seems that the use of these "advanced" names in such publications retards instead of advances ornithology. We must consider our readers and write in the language that they can understand.

That it is not necessary to be "up to the minuit" in matters of nomenclature in order to do excellent ornithological work may be seen in the publications of the members of the Cooper Ornithological Club. Our Californian co-workers it is true recognize certain races not accepted in the A. O. U. 'Check-List' but in matters of pure nomenclature, generic division, etc., they are content to follow the 'Check-List.' 'The Auk' has not

<sup>&</sup>lt;sup>1</sup> Names of new races not yet included in the 'Check-List' may of course be employed if desired with footnotes showing their equivalents in the 'Check-List' nomenclature.

been as careful as it should have been in this matter but in the future all contributors will be requested to conform strictly with the 'Check-List' in all local lists unless footnote equivalents are given.

This whole matter takes on a very much more serious aspect just at present, for, as will be seen below, the time is ripe for a very much wider uniformity in nomenclature, through the co-operation of all English speaking ornithologists, and unless we agree to sink our personal preferences so far as ordinary publications go and use the nomenclature endorsed by our national organization, what hope can there be for international agreement?

We do not in any way wish to criticise the excellent papers which we have used as examples. They simply happened to be among the publications reviewed in this issue. It is the *principle* that we are considering and we feel sure that most or all of those who have employed "advanced nomenclature" for "every day use" did so thoughtlessly or were mislead as to the character of the 'Lists of Proposed Changes' published in 'The Auk.'—Wither Stone.

In reviewing the recent 'Hand-List of British Birds' by Dr. Hartert and his associates the Editor of 'The Auk' had occasion to comment upon the remarkable correspondence between the nomenclature there adopted and that of the A. O. U. Check-List in cases where the same genera or species were considered and concluded with the following: "This comparison shows that it will now be very easy for American and British ornithologists to come together on matters of nomenclature."

The time for bringing about this result seems to have arrived, thanks to the initiative taken by the Committee of the British Ornithologists' Union. Some months ago they appointed a committee on a 'Systema Avium' consisting of Lord Rothschild, Drs. Eagle Clark and Hartert, Messrs. G. M. Mathews, T. Iredale, W. L. Sclater, E. C. Stuart Baker and C. Chubb. It was proposed that this committee enter into correspondence with the A. O. U. to propose a joint list of bird names of the world to be known as the 'Systema Avium.' The suggestion is that the work consist of six volumes covering the six great zoölogical regions, the A. O. U. being responsible for North and South America and the B. O. U. for the Old World volumes, and that a joint committee settle all questions of nomenclature of genera and species where they are not already in accord.

The matter will come before the A. O. U. at its next meeting and it is to be hoped that in the near future the actual work may be under way although publication will of course be out of the question until after the war. Such a work endorsed by all the English speaking people of the world would go a long way toward establishing a universal nomenclature for birds.

As is generally known legislation for the protection of migratory birds in North America has taken the form of a treaty between the United States and Great Britain, putting the matter on a more stable and permanent basis than could be done in any other way. After being ratified by both

governments the treaty was proclaimed by the President on December 8, 1916. Canada by an act of Parliament gave full effect to the convention August 29, 1917, and issued regulations, May 11, 1918. Congress took similar action on July 3, 1918 and on the 31st of the same month President Wilson issued a proclamation containing regulations for the enforcement of the treaty in the United States, so that the treaty is now in full force.

The birds covered by the regulations include the Anatidæ, Gruidæ, Rallidæ, Limicolæ, Columbidæ and all migratory insectivorous birds as well as Grebes, Loons, Auks, Herons, Gulls and Terns, Petrels and Shearwaters. The open seasons correspond closely with those previously in force under the Migratory Bird Law, but everyone should secure a copy of the pamphlet issued by the Department of Agriculture which contains the text of the treaty and the regulations.

The section which especially interests field ornithologists is that dealing with collecting for scientific purposes. Every collector of birds or eggs must hereafter have a permit from the Secretary of Agriculture, and anyone collecting without such permit will be vigorously prosecuted by the Federal authorities. Permits may be obtained without cost by applying to the Secretary of Agriculture but the applicant must have the endorsement of two well-known ornithologists. Blanks for application may be had from the Department of Agriculture, Washington, D. C.

Col. William Vincent Legge, a Corresponding Fellow of the American Ornithologists' Union, died at his home in Tasmania on March 25, 1918, in his 75th year. He was born at Fullenswood, near St. Mary's, Tasmania, September, 1841, the son of R. V. Legge one of the earliest settlers of the country. We learn from 'The Emu,' that he went to England with his parents at the age of 12, crossing the isthmus of Panama on mule back. He was educated at Bath and also in France and Germany, becoming an accomplished linguist. Receiving his commission in the British Army in 1862 he was successively stationed in England, Melbourne and Ceylon his final appointment being Commandant of the Tasmanian Military forces, which position he held for eleven years, retiring from the service after the Boer War. His later years were spent in agricultural pursuits on his home estate.

Col. Legge's chief interests outside of his profession were, forestry, physiography and ornithology. He was one of the founders of the Royal Australasian Ornithologists' Union and its first president. During his nine years service in Ceylon he gathered the materials for his most important ornithological work, 'The Birds of Ceylon' in two volumes, quarto, with colored plates, which he published during a subsequent staff appointment in England. During his sojourns in that country he was very intimate with the late Dr. Bowdler Sharpe and frequently visited John Gould, the "father of Australian ornithology.' Among Col. Legge's other ornithological publications may be mentioned, his 'Systematic List of Tasmanian Birds. The Geographical Distribution of the Australian Limicolæ'

while he took an important part in the compilation of the List of Vernacular Names of Australian Birds' and the R. A. O. U. Check-List.

DR. ROBERT LATSHAW WALKER, an Associate Member of the A. O. U., died at Carnegie, Pa., November 19, 1916, in his seventy-ninth year. Dr. Walker was born in Pittsburgh, July 26, 1838, and at the age of sixteen removed with his parents to Woodville, where he grew to manhood. His early education was obtained at the Western University of Pennsylvania (now University of Pittsburgh), and he took his medical degree at the University of Pennsylvania. In 1866 he began the practice of his profession in what was then Mansfield Valley, now the borough of Carnegie. Dr. Walker was always a lover of outdoor sports and natural history, and had amassed a library of considerable size on these subjects, of which ornithological books formed a large part. He was elected an Associate Member of the A. O. U. in 1888, and while he did not, so far as known to the writer, contribute to the ornithological magazines, he was well informed on the subject in general, and took a great interest in the progress of the science. Dr. Walker had a personality that endeared him to a large circle of friends and acquaintances, by whom he is surely missed.- W. E. CLYDE TODD.

Professor Jonathan Young Stanton, an Associate of the American Ornithologists' Union, 1883–1918, died at his home in Lewiston, Maine, February 17, 1918, of pneumonia after a short illness.

Professor Stanton was born in Lebanon, Maine, in June, 1834, and graduated from Bowdoin College in the class of 1856. He took up the study of law in the office of D. C. Christie, Dover, N. H., for a time; but relinquishing the law, with the exception of two or more years at the Theological Seminary at Andover, Mass., devoted himself to the office of a teacher: two years in the New Hampton Institution, New Hampshire, and two years as principal of Pinkerton Academy, Derry, New Hampshire. In 1863 he was elected Professor of Greek and Latin in Bates College, Lewiston, Maine, holding this position until 1906 when failing health forced him to resign his active professorship, when he was made Professor emeritus. In 1874 he travelled abroad.

Professor Stanton was a man of broad scholarship, and among numerous other subjects, took a deep interest in the study of ornithology. For many years he conducted classes in this subject both in the lecture room and in the field, and after his retirement in 1906 until about a year before his death continued to give lectures and conduct field classes.

Though of a modest and retiring nature, through a correspondence with prominent naturalists in this country and in Europe, including Darwin and Wallace; and through his long labors at the College, he became widely known to ornithologists and bird lovers. Many a teacher today is passing on the inspiration received from Professor Stanton.

Early in life he began the formation of a collection of birds and an orni-

thological library, which became quite notable and were recently installed in the College museum and library.

With his splendid equipment and profound knowledge, it is to be regretted that he wrote almost nothing for publication. Deeply as he loved the works of nature, his deepest love and sympathy was directed to man, and especially to the young men and women of the College, who came to regard him with an unusual degree of reverence.

At the first meeting of the Maine Ornithological Society, held in Gardiner, Maine, December, 1896, he was elected to Honorary membership.

In 1866 he was married to Harriet P. Woodman of Portland, whom he survived by about twenty-two years.

Two good photographs of Professor Stanton are to be found in Carrie E. Miller's, Birds of Lewiston-Auburn and Vicinity, published at Lewiston, 1918.— A. H. NORTON.

THE National Academy of Sciences at its April meeting awarded to Dr. Frank M. Chapman, curator of ornithology at the American Museum of Natural History, the first Daniel Giraud Elliot medal and honorarium, for his recent work on the distribution of bird-life in Colombia.

The Elliot fund was established by Miss Margaret Henderson Elliot in memory of her father and the award is to be made annually for preeminence in zoölogy or palseontology. Ornithologists throughout the country, we feel sure, will heartily endorse the action of the National Academy. It is particularly gratifying that an ornithologist should be the first to be so honored and peculiarly appropriate that one so closely associated with Dr. Elliot should receive the first Elliot medal. Incidentally it may be mentioned that on March 1, 1918, Dr. Chapman completed his thirtieth year of connection with the American Museum, being now second in point of seniority on its scientific staff.

Dr. Charles W. Richmond, for many years Assistant Curator of the Division of Birds in the United States National Museum, has recently been appointed Associate Curator. Mr. B. H. Swales has been appointed Honorary Curator of birds' eggs in the same institution.

AGITATION for increasing the catch of fish as an emergency measure for food supply during the war has caused undue agitation against the Pelicans especially in the Gulf States. The National Association of Audubon Societies and the Conservation Commission of Louisiana have undertaken an investigation of the food of the bird and the Audubon Society of Florida has issued a pamphlet in its defence. The reports of its destruction of food fishes have evidently been greatly exaggerated.

At the annual meeting of the British Ornithologists' Union held on March 13, 1918, Dr. W. Eagle Clarke was elected president to succeed Col. R. Wardlaw Ramsey who had served for the last five years. The membership of the Union stands as follows: Ordinary 423, Extraordinary 1, Honorary 8, Honorary Lady (the only lady members) 8, Colonial 9, and Foreign 19. The Honorary and Foreign (equivalent to the Corresponding Class of the A. O. U.) it will be noticed are much more restricted than in the A. O. U. The American ornithologists represented in these classes are as follows:

Honorary, Dr. J. A. Allen, Dr. Frank M. Chapman, Dr. Harry C. Oberholser, Dr. Chas. W. Richmond and Mr. Robert Ridgway.

Foreign, Dr. Leonhard Stejneger and Dr. Witmer Stone.

THE ASSOCIATES OF THE A. O. U.— The By-Laws of the Union provide that Associates shall be unlimited in number but shall be residents of America. So long as a person maintains residence in America he may keep his status as an Associate even though he may reside temporarily in a distant part of the world. Thus at the present time one Associate is living in British Papua, another in Ceylon, and a third in Samoa.

At the first meeting 87 Associates were elected but apparently several failed to qualify, for at the next meeting in spite of the fact that only two deaths had occurred during the year the number was reported as only 63. In April 1918, the total number as shown by the list published in 'The Auk' was 745 including 5 Life Associates. Of these, 142, or nearly 20 per cent were women. Practically all of the 120 persons that have been elected Members and about one half of the present Fellows were originally elected as Associates. In addition to losses by resignation or otherwise the losses by death since the organization of the Union have been 165.

The class of Associates includes several distinct groups. It comprises not only the younger bird students and those who on account of a general interest in birds wish to keep in touch with the progress of bird study, but also those who have a temporary interest in ornithology. The more active ornithologists and especially those who are engaged in bird study in a professional capacity are usually promoted to the classes of Members and Fellows. Unfortunately many of those whose interest is only temporary drop out after a few years so that changes are frequent and extensive. But in spite of these changes the class of Associates forms a very important part of the membership. It includes much of the enthusiasm, vigor and strength of the Union and every effort should be made to stabilize it and increase it to several times its present size.— T. S. P.

CALLED TO THE COLORS.—Since the publication of the July number of 'The Auk' of the third list of A. O. U. members in military service, a few additional names and changes have been reported. The additions are as follows:

BERGTOLD, DR. WILLIAM HARRY, Denver, Colo. Major Medical Corps, U. S. Gen. Hospital No. 21, Denver, Col.

Britten, Dr. George Sidney, Syracuse, N. Y. Captain Medical Corps, American Expeditionary Forces, in France.

DICE, LEE RAYMOND, Washington, D. C. Private 5th Co., 2d Training Battalion, 154th Depot Brigade, Camp Meade, Md.

- FOWLER, FREDERICK HALL, Palo Alto, Calif. Captain of Engineers, Office Chief of Engineers, Washington, D. C.
- FRY, REV. HENRY JACOB, Montclair, N. J. Chaplain U. S. Navy.
- LORING, JOHN ALDEN, Owego, N. Y. Captain of Ordnance.
- MURIE, OLAUS JOHAN, Moorhead, Minn. Cadet Army Balloon School, Fort Omaha, Nebr.
- OVERTON, DR. FRANK, Patchogue, N. Y. Captain Medical Corps, Fort Oglethorpe, Ga.
- POOLE, EARL L., Reading, Pa. Signal Service, in France.
- Sweeney Joseph A. Halsey, Nebr. Private Co. E, 2d Battalion, 20th Engineers (Forest), American Expeditionary Forces, in France.

The following changes and corrections should also be mentioned. Major Philip J. McCook is now Adjutant of the 9th Brigade in France. Lieut. Francis Harper and Lieut. E. G. Holt have been promoted to 1st Lieutenant and transferred to the Sanitary Corps. Tracy I. Storer has also been commissioned a 1st Lieutenant in the Sanitary Corps and detailed on the laboratory car 'Metchnikoff,' at Fort Sam Houston, San Antonio, Texas. F. C. Lincoln is an acting sergeant in the Pigeon Section of the 293d Aero Squadron at March Field, Riverside, Calif., and Charles H. Rogers is a Sergeant in the 31st Machine Gun Battalion, 11th Division, Camp Meade, Md. Private F. G. Hall is in the Aviation Section of the Signal Corps at Madison Barracks, N. Y. Private F. P. Metcalf has been transferred to the U. S. Signal Corps Radio School at College Park, Md., and Walt. F. McMahon a private in Infantry is now in France. The name of Horace W. Wright was included in the last list through error.

In the Canadian Forces Ernest M. Anderson is in A Co., R. C. R., B. C. Special Service Unit at Quebec; Harrison M. Laing is in the Instructional Section of the School of Aerial Gunnery at Beamsville, Ontario; and Harrison F. Lewis has been discharged on account of disability and is now District Auditor in Militia District No. 5 at Quebec.

Relatives or friends who may have additional information concerning these or other members are requested to communicate at once with the Secretary giving any facts as to rank, branch of the service or present location of members in military service in order that necessary corrections in the list may be made before the annual meeting.

T. S. Palmer,

1939 Biltmore St., N. W. Washington, D. C. Secretary.

ATTENTION is again called to the thirty-sixth stated meeting of the A. O. U. to be held at the American Museum of Natural History, New York City, November 12–14, 1918. As many of our members are now serving their country the duty of keeping alive the activities of the society in which all are so deeply interested, devolves upon those who are still at home. It is to be hoped that everyone who can possibly do so will arrange to attend the New York meeting.

# INDEX TO VOLUME XXXV.

[New generic, specific, and subspecific names are printed in heavy face type.]

Abbot, John, drawings by, 271-286. Acanthis hornemanni exilipes, 466.

h. hornemanni, 461. linaria, 466.

l. linaria, 150, 232.

Accipiter bicolor bicolor, 443.

b. fidens, 444.

cooperi, 24, 45, 279, 281, 283, 345.

nisus, 253.

velox, 24, 45, 279.

Actitis macularia, 22, 43, 331, 446. Adelomyia melanogenys maculata, 451.

Æchmophorus occidentalis, 42. Ægialeus, 205.

Ægialitis hiaticula major, 205.

meloda, 23. nivosa, 206, 332.

semipalmata, 332.

Ægotheles cristata centralia, 368.

c. melvillensis, 368.

c. olivei, 368. c. tasmanica, 368.

Aeronautes melanoleucus, 235.

Æstrelata diabolica, 202.

fisheri, 221.

hasitata, 202.

Æthiopsar fuscus infuscatus, 377.

Æthopyga scheriæ tonkinensis, 100. Agapornis madagascariensis ablectanea, 258.

Agelaius gubernator californicus, 209.

phœniceus californicus, 209.

p. neutralis, 149.

p. phœniceus, 137, 280, 281, 347.

Aix sponsa, 20, 296.

Alabama, 224.

Alaska, 221, 387-404.

Alauda arvensis kiborti, 100.

Alberta, 489.

Alcyone azurea distincta, 368.

a. wallaceana, 368.

Alectroenas nitidissima, 377.

Allen, Francis H., the Slate-colored Junco breeding near Boston, 482.

Allen, Glover M., obituary of W. R. Zappey, 263; obituary of Dr. J. C. White, 265.

Alphapuffinus, 215.

Aluco pratincola, 25.

Amazona amazonica tobagensis, 365.

American Ornithologists' Union, thirty-fifth stated meeting of, 65-73; fellows of, 110; foreign members, 266; members of, 384; associates of, 513.

Ammodramus savannarum australis, 138, 284, 347.

s. bimaculatus, 151.

Ammospiza, 210.

caudacuta caudacuta, 210.

c. nelsoni, 210.

c. subvirgata, 210.

Amphispiza nevadensis nevadensis, 152.

Anas fulvigula, 216.

f. maculosa, 216. platyrhynchos, 20, 42.

rubripes, 20, 350.

r. tristis, 203.

Andropadus importunus noomei, 102.

Anhinga vulsini, 258.

Anomalospiza butleri, 498.

Anous stolidus, 338.

Anser albifrons, 94.

gambeli, 94. Anthoscopus, 500.

Anthreptes hypogrammica inten-

sior, 256. Anthus rubescens, 156, 212, 281, 304.

sordidus arabicus, 258.

s. sokotræ, 258.

spinoletta rubescens, 212.

Antrostomus carolinensis, 280.

vociferus vociferus, 27, 300. Aphelocoma californica, 250.

c. californica, 481.

c. hypoleuca, 480.

c. immanis, 250, 208.

c. obscura, 250, 481.

c. ooclepta, 250.

c. woodhousei, 208.

cyanotis, 217.

woodhousei, 208

Aphriza virgata, 332.

Aquilla chrysætos, 45.

Ara militaris militaris, 447.

Aramides cajanea salmoni, 376.

Aratinga cactorum perpalida, 365.

frontatus, 447.

rubrolarvatus, 447.

Archibuteo ferrugineus, 45.

lagopus sancti-johannis, 351.

Archilochus alexandri, 49.

colubris, 28, 346, 359.

'Ardea,' reviewed, 101, 257, 378, 501.

Ardea cinerea firasa, 100.

heròdias herodias, 20, 284, 341.

h. occidentalis, 204.

h. olgista, 216.

h. treganzæ, 42.

h. wardi, 204.

occidentalis, 204.

thula, 204.

Ardenna, 201.

carneipes, 201.

creatopus, 201. gravis, 201.

Arenaria interpres interpres, 439.

i. morinella, 332, 341. melanocephala, 333.

Argyroceyx, 368.

Arquatella maritima couesi, 328. m. maritima, 233.

Arthur, Stanley C., review of his 'Birds of Louisiana,' 247.

Asio accipitrinus, 345.

asio wilsonianus, 207.

flammeus, 25, 46, 223, 298, 345.

wilsonius, 25, 46, 183, 297, 345,

Astragalinus psaltria arizonæ, 217.

p. croceus, 462.

p. mexicanus, 217.

tristis pallidus, 150.

t. tristis, 137, 279, 347.

Astur atricapillus, 185, 206.

a. atricapillus, 24, 351.

a. striatulus, 45.

gentilis atricapillus, 206.

g. striatulus, 186, 206. palumbarius, 253.

Asyndesmus lewisi, 49.

Attagis gayi fitzgeraldi, 256. g. simonsi, 256.

Audubon, John J., uncolored prints of his bird plates, 29-32; notice of life of, 86-89; 'Ornithological

Biography,' 360. Australia, 97, 246, 368, 490.

'Austral Avian Record' reviewed,

'Avicultural Magazine,' reviewed, 100, 256, 377, 500.

Avocet, 235, 327, 372.

Вжогорния bicolor, 146, 279, 343.

inornatus murinus, 213. wollweberi, 214.

w. annexus, 214.

Bailey, Florence M., notice of her 'List of Birds of Glacier National Park,' 492.

Baldpate, 42, 74, 238, 340.

Bancroft, W. F., notice of his 'Directory of Officials and Organizations Concerned with the Protection of Birds and Game, 1918,' 496.

Bangs, Outram, notice of his 'Notes on the Geographical Races of Tangara gyroloides,' 490.

Bangs, Outram and Noble, G. K., notice of their 'Description of a New Woodpecker from Peru,' 490; list of birds collected on the Harvard Peruvian Expedition of 1916, 442–463.

Bangs, Outram and Penard, Thomas E., notice of their 'Notes on a collection of Surinam Birds,'

Bannermania, 216.

Barbour, Robert, scarcity of birds in the spring migration of 1918, 484.

Bartramia longicauda, 22, 43.

Batchelder, Charles F., notice of his 'Two Undescribed Newfoundland Birds,' 248.

Batten, George, obituary notice of, 264.

Bayliss, Clara K., a study of the Yellow-billed Cuckoo, 161–164. Beebe, William, review of his 'Trop-

ical Wild Life in British Guiana, 91–93.

Belding, Lyman, obituary of, 106.
Bent, A. C., Pterodroma gularis in
North America, 221.

Bergtold, W. H., the Harpy Eagle in Colorado, 77–78.

Bird Conservation, notice of reports on, 97, 249, 370.

Bird Song, 133-135.

Birds as distributors of Hog Cholera, 253.

'Bird-Lore,' reviewed, 98, 254, 374, 497.

Bittern, 20, 42, 345, 477, 484. Least, 20, 341.

Blackbird, Brewer's, 150, 347. Red-winged, 137, 238, 347. San Diego Red-winged, 149. Yellow-headed, 81, 149, 224.

Bluebird, 147, 349. Mountain, 159.

Western, 159.

Bobolink, 136, 346.

Bob-white, 23, 43.

Bombycilla cedrorum, 140, 154, 212, 281.

garrula, 81, 154, 226. g. pallidiceps, 212.

Bonasa umbellus togata, 44. u. umbellus, 23.

Booby, 337.

Red-faced, 337.

Botaurus lentiginosus, 20, 42, 345, 477, 484.

Bowdish, B. S., Noddy Tern in Porto Rico, 507.

Bowles, J. H., the Limicolæ of the state of Washington, 326-333.

Brachyramphus craverii, 215. hypoleucus, 215.

Brachyspiza capensis peruviana, 462.

Braislin, William C., an American edition of Audubon's 'Ornithological Biography,' 360-362.

Brannon, Peter A., the Starling in Montgomery, Alabama, 224.

Branta bernicla bernicla, 204. b. collaris, 204.

b. glaucogastra, 204.

Brennen, George A., Sharp-tailed Grouse at Tremont, Indiana, 75. Brewster, William, the European Widgeon in Massachusetts, 75; nesting of the Red Crossbill (Loxia curvirostra minor) in Essex County, Massachusetts, 225; the subspecific name of the Northern Parula Warbler, 228.

'British Birds,' reviewed, 100, 256, 377, 499.

British Columbia, 234.

British Guiana, 91-93.

British Ornithologists' Club, review of 'Bulletin,' 100, 256, 376, 498.

British Ornithologists' Union, annual meeting of, 512.

Brockway, Arthur W., large flight of Great Horned Owls and Goshawks at Hadlyme, Connecticut, 351.

Brooks, W. Sprague, Massachusetts notes, 234.

Brown, E. J., Melospiza melodia phæa in southern California, 350.

phæa in southern California, 350.Bubo virginianus heterocnemis, 233.

v. lagophonus, 47. v. pallescens, 47.

v. subarcticus, 217.

v. virginianus, 26, 298.

v. wapacuthu, 217.

Buffle-head, 42, 340.

Bunting, Indigo, 139, 359.

Lazuli, 153. Painted, 281.

Snow, 241.

Burleigh, Thomas D., breeding of the Pied-billed Grebe (Podilymbus podiceps) near State College, Center Co., Pa., 218; the Hudsonian Chickadee (Penthestes hudsonicus subsp.?) in northeastern Pennsylvania, 230.

Buteo borealis borealis, 24.

b. calurus, 45.

b. krideri, 345.

b. umbrinus, 207.

lineatus alleni, 281, 283.

1. lineatus, 24.

platypterus, 24, 283.

Buteo p. iowensis, 207, 478. swainsoni, 45. vulgaris, 253.

Buteola, 207.

brachyura, 207.

Butorides virescens virescens, 21, 85, 296.

Calamanthus campestris peroni, 100.

Calcarius lapponicus lapponicus, 342.

Calidris leucophæa, 205, 330. l. rubida, 205.

California, 94, 250, 321–326, 350.

Calonectris, 201.

kuhlii borealis, 201.

Calyptophilus, 256.

Campephilus principalis, 285. Camptostoma sclateri, 454.

Canada, 479.

Cardinal, 139, 342, 359.

Cardinalis, 499.

cardinalis cardinalis, 139, 283, 342, 359.

Carpodacus mexicanus obscurus, 209.

purpureus purpureus, 137, 341. Cary, Merritt, notice of his 'Life Zone Investigations in Wyoming,'

'Cassinia' for 1917, reviewed, 369. Catamenia homochroa, 462.

Catbird, 145, 156, 348.

Catharista urubu, 233.

Cathartes aura septentrionalis, 23, 45, 84, 297, 341.

Catoptrophorus semipalmatus inornatus, 331.

Centrocercus urophasianus, 44.

Centurus carolinus 27, 285, 359. radiolatus, 495.

uropygialis brewsteri, 208.

Ceophlœus lineatus lineatus, 450. Cephalopterus ornatus, 453.

Cepphus snowi, 215.

Cerchneis sparverius caucæ, 445.

Cerchneis tinnunculus, 253.

Cercomacra cinerascens immaculata 498.

> tyrannina saturata, 498. t. pallescens, 498.

Certhia brachydactyla, 464.

familiaris, 464.

f. americana, 146, 282, 464. f. montana, 156.

Ceryle alcyon, 184, 283, 355. a. alcyon, 26, 234.

Ceycalcyon, 368.

Ceycoides, 368.

Chætura pelagica, 28, 284, 346. vauxi, 49, 235.

Chalcoparia singalensis koratensis, 376.

Chamæpetes fagani, 100.

Chæmepelia passerina terrestris, 282.

Chapman, F. M., review of his 'Distribution of Bird Life in Colombia,' 242-243; awarded the Elliot medal, 512.

Charadrius dominicus, dominicus, 43, 332.

hiaticula septentrionalis, 205. melodus, 205. semipalmatus, 205.

Charitonetta albeola, 42, 340.

Chat, Long-tailed, 155. Yellow-breasted, 144.

Chen, 123.

cœrulescens, 222, 438. hyperboreus hyperboreus, 437. h. nivalis, 234.

Chickadee, 146.

Carolina, 146. Chestnut-backed, 158.

Hudsonian 230, 231, 343.

Labrador, 37, 83, 306.

Long-tailed, 157. Mountain, 157, 379.

Childs, John Lewis, notice of the catalogue of his library, 93. Chile, 249. China, 246, 370.

Chizœrhis, 500.

Chloroceryle, 353.

americana cabanisi, 450.

Chlorcenas cenops, 446.

Chloropetella suahelica, 102.

Chloropsis aurifrons inornatus, 376.

Chondestes grammacus grammacus, 138.

g. strigatus, 151.

Chondrohierax uncinatus megarhynchus, 445.

Chordeiles minor aserriensis, 208.

m. chapmani, 208.

m. henryi, 208.

m. hesperis, 208.

m. howelli, 208.

m. minor, 208.

m. sennetti, 208.

virginianus hesperis, 49.

v. virginianus, 28, 280.

Chrysoptilus atricollis lymani, 450, 490.

Chrysotrogon caligatus, 480.

Chuck-will's-widow, 280.

Circus cyaneus hudsonius, 206. hudsonius, 23, 206, 345.

Cirrepidesmus, 205.

mongolus, 206.

Cisticola cisticola arabica, 258.

Cistothorus stellaris, 145, 284, 305.

Clangula clangula americana, 296.

Clark, Hubert Lyman, tail feathers and their major upper coverts, 113-123; notes on the anatomy of the Cuban Trogan, 286-289; the pterylosis of the Wild Pigeon, 416-420.

Clarkona, 97.

Coale, Henry K., Summer Tanager (Piranga rubra rubra) in northwestern Illinois, 226.

Coccyzus americanus americanus, 26, 283.

erythrophthalmus, 26, 283. minor nesiotes, 208.

Cœreba magnirostris, 459.

Colaptes auratus auratus, 285.

a. luteus, 27, 346.

cafer collaris, 49.

rufopileus, 208.

Cole, L. J., feather pigments, 105. Colibri iolatus brevipennis, 366.

Colinus virginianus virginianus, 23,

Colombia, 240, 242.

Colorado, 77-79, 81-82, 223, 229, 236.

Columba anolaima, 256. ogilvie-granti, 100.

Colymbus auritus, 218.

nigricollis californicus, 234.

Comey, Arthur C., Black-poll Warbler lingering in Massachusetts, 82.

Compsocoma sumptuosa sumptuosa, 459.

Compsothlypis americana americana, 284.

a. pusilla, 228.

a. usneæ, 142, 228.

'Condor, The,' reviewed, 99, 255, 375, 497.

Connecticut, 229, 232, 340-344, 351.

Conopophaga aurita occidentalis, 256.

peruviana, 451.

Cooke, M. T., notes from the vicinity of Washington, D. C.,

Coot, 22, 42.

Copeland, Ada B., Bohemian Waxwing in Grand Junction, Colo., 81.

Coprotheres pomarinus camtschaticus, 200.

p. pomarinus, 200.

Cormorant, Double-crested, 340. Florida, 357.

Corthylio calendula cineraceus, 214.

Corvus brachyrhynchos brachyrhynchus, 136, 246.

b. hesperis, 149.

corax clarionensis, 209, 503. europhilus, 502.

c. principalis, 136, 503.

e. sinuatus, 149, 503.ossifragus, 136.

Cory, Charles B., review of his 'A Catalogue of Birds of the Americas,' 365.

Coryphospingus cucullatus, 462. Corythopsis torquata sarayacuensis,

376.

Coturnix coturnix, 102.

c. confissa, 102.

c. conturbans, 102.

c. inoperata, 102.

Cowbird, 137, 347.

Nevada, 149.

Crane, Sandhill, 42.

Creciscus jamaicensis, 21, 85.

Creeper Brown, 146.

Rocky Mountain, 156.

Crinifer, 500.

Crossbill, Red, 137, 225, 301.

White-winged, 236, 301, 342.

Crow, 136, 247, 346, 405-416.

Fish, 136.

Western, 149.

Cryptoglaux acadica, 351.

a. acadica, 26, 47, 298.

funerea richardsoni, 217, 298. tengmalmi richardsoni, 217.

Crypturellus tataupa inops, 445.

Cuckoo, Black-billed, 26.

Yellow-billed, 26.

Curlew, Hudsonian, 331, 438. Long-billed, 43, 331.

Cyanoceyx, 368.

Cyanocitta cristata cristata, 136, 343. c. florincola, 359.

stelleri annectens, 148.

Cyanocorax mysticalis, 457.

Cyanopica cyanus interposita, 258.

Cyclarhis coutrerasi, 458.

Cyclarhis virenticeps, 458. Cymbilaimus lineatus intermedius, 258.

Cymochorea, 216.

Dacnis cayana glaucogularis, 459. Dafila acuta, 238.

Dendragapus obscurus richardsoni, 44.

Dendrocygna viduata, 216.

Dendrocygninæ, 203. Dendroica æstiva æstiva, 142, 155,

282, 348. a. amnicola, 248.

auduboni auduboni, 155.

cærulescens cærulescens, 142. castanea, 343.

cerulea, 142.

coronata, 383, 465.

c. hooveri, 465.

discolor, 143, 284, 343.

dominica albilora, 485.

d. dominica, 283.

fusca, 143.

magnolia, 142, 441.

palmarum hypochrysea, 283.

p. palmarum, 232.

pensylvanica, 142, 282.

striata, 284, 303.

tigrina, 285, 303, 343.

townsendi, 155.

virens, 143, 282, 441.

vigorsi, 143, 280.

Dicæum cruentatum siamensis, 376. trigonostigma megastoma, 498.

Dice, Lee Raymond, the birds of Walla Walla and Columbia Counties, southeastern Washington, 40-51, 148-159.

Dickcissel, 348.

Dicrurus annectens siamensis, 376. ater, 502.

leucophæus, 502.

Dictiopicus, 245.

Diglossopsis cærulescens pallida, 458. Diomedia sanfordi, 249. chionoptera, 249.

Dionne, C. E., the Whistling Swan at Cap St. Ignace, P. Q., 222.

District of Columbia, 85, 351, 366, 483.

Dixon, Joseph, the nesting grounds and nesting habits of the Spoonbilled Sandpiper, 387-404.

Dolichonyx oryzivorus, 136, 281, 346.

Dove, Mourning, 23, 344.

Porto Rica, 339.

Western Mourning, 44.

White-winged, 76.

Dowitcher, Long-billed, 235, 328.

Dryobates borealis, 281.

pubescens homorus, 48.

p. medianus, 27, 223, 236.

p. pubescens, 285, 359.

villosus auduboni, 281, 359.

v. monticola, 48.

v. villosus, 26.

Duck, Black, 20.

Harlequin, 437.

Lesser Scaup, 20, 372.

Wood, 20, 296.

Ducks, sickness of, 490.

Dumetella carolinensis, 145, 156, 280, 348, 359.

Dunlop, Eric B., obituary notice of, 266.

Dutch Guiana, 369.

Dysithamnus semicinereus, 452.

Dwight, Jonathan, a new species of Loon (Gavia viridigularis) from northeastern Siberia, 196–199; sight records, 262; review of his 'The geographic Distribution of Color and other variable Characters in the genus Junco,' 486–489.

EAGLE, Bald, 25, 78. Harpy, 77, 78.

Economic Ornithology, recent papers on, 253, 372-374, 496.

Economic ornithology in recent entomological publications, 251– 253, 493–494.

Ectopistes migratorius, 23, 282, 416-420.

Edolisoma, 256.

Egret, 438.

Egretta candidissima, 204.

thula thula, 204. t. brewsteri, 204.

Eider, 499.

'El Hornero,' reviewed, 378, 384.

Elaenea leucospodia, 454.

Elanoides forficatus, 285.

Elseya, 206.

dubia, 206.

Embernagra gossei, 255. platensis, 255.

Empidochanes pœcilurus peruanus,
455.

Empidonax difficilis, difficilis, 51.

flaviventris, 28, 301.

hammondi, 51.

minimus, 29, 346.

trailli, 259.

t. alnorum, 28, 259.

t. brewsteri, 259.

t. trailli, 51, 259.

virescens, 29, 232.

wrighti, 51.

'Emu, The,' reviewed, 100, 257, 377.

Eno, Henry Lane, Hudsonian Chickadee (Penthestes hudsonicus subsp.?) at Princeton, N. J.,

231.

Eos guenbyensis, 379. reciniata, 379.

Ephthiaura crocea, 100.

Ereunetes mauri, 329.

Erionotus albiventris, 452.

Erismaturinæ, 203.

Erolia ferruginia chinensis, 204.

Eroliinæ, 204.

Estrilda astrild gabonensis, 498.

Eudyptila undina, 257.

Eupelia cruziana, 447.

Euphagus carolinus, 251, 284, 285. cyanocephalus, 150, 347.

Eupsittula pertinax margaritensis, 365.

Eupsychortyx, 245.

Eurynorhynchus pygmæus, 387–404.

FALCO æsalon, 216.

columbarius columbarius, 46, 439.

dieroleucus, 445.

mexicanus, 45.

peregrinus, 253.

p. anatum, 25.

regulus, 216.

sparverius sparverius, 25, 46, 282, 297, 345.

Falcon, Prairie, 45.

Finch, Purple, 137, 341.

Finsch, Friedrich Hermann Otto, obituary notice of, 381.

Fisher, A. K., obituary notice of George Batten, 264; occurrence of Goshawks (Astur a. atricapillus) and Saw-whet Owl (Cryptoglaux acadicus) in the vicinity of

Washington, D. C., 351. Flicker, Northern, 27, 346.

Red-shafted, 49.

Florida, 357, 479.

Florida cærulea, 75.

Flycatcher, Acadian, 29, 232.

Alder, 28.

Crested, 28, 346, 354, 439.

Hammond's, 51.

Least, 29, 346.

Olive-sided, 28, 51.

Traill's, 51.

Western, 51.

Wright's, 51.

Yellow-bellied, 28, 301.

Francolinus lathami schubotzi, 259.

Fratercula arctica arctica, 200.

a. deleta, 200.

Fregata, 203.

aquila, 203.

magnificens, 338.

m. rothschildi, 203.

minor palmerstoni, 203.

Fry, William, notice of his 'List of Birds of Sequoia National Park,'

Fulica americana, 22, 42.

Furnarius cinnamomeus, 453. leucopus hauxwelli, 498.

GABRIELSON, Ira N., notice of his 'A List of the Birds of Clay and O'Brien Counties, Iowa,' 370.

Gallinago delicata, 22, 42, 328.

Gallinula galeata, 22, 284.

Gallinule, Florida, 22.

Ganier, A. F., notice of his 'Preliminary List of the Birds of Tennessee.' 93.

Garrulax moniliger fuscata, 377.

Gates, F. C., notice of his 'Birds of Carthage, Illinois,' 94.

Gavia arctica arctica, 196.

a. suschkini, 196.

immer, 19, 294. stellata, 219, 235.

viridigularis, 198.

Gee, N. Gist, and Moffett, L. I., notice of their 'Birds of the Lower Yangtse Valley,' 246.

Gelochelidon nilotica, 215. anglica, 215.

Georgia, 76, 271-286, 485.

Geositta peruviana paytæ, 452.

Geothlypis trichas brachydactyla, 212.

t. ignota, 280.

t. occidentalis, 155.

t. trichas, 144, 484.

beldingi goldmani, 212.

Geranospiza niger balzarensis, 376. Glaucidium gnoma californicum, 48.

> g. hoskinsi, 208. hoskinsi, 208.

Glaucidium jardinii, 449.

Glaucomorpha, 102.

Glottis melanoleuca, 205.

Gnatcatcher, Blue-gray, 146, 484.

Goelitz, Walter A., the destruction of nests by farming operations in Saskatchewan, 238–240.

Golden-eye, 372.

American, 296.

Goldfineh, 137, 347.

Pale, 150.

Goose, Blue, 222, 438.

Canada, 238.

Greater Snow, 234.

Snow, 437.

White-fronted, 94.

Goshawk, 24, 241, 351, 372, 478.

Western, 45.

Goudot, Justice, historical sketch of,

Grackle, Bronzed, 137, 440.

Florida, 440.

Purple, 137, 440.

Grallaria albiloris, 452.

punensis, 376.

Grallaricula nana kukenamensis, 498.

Graucalus macei siamensis, 377.

Grebe, Eared, 234.

Horned, 218.

Pied-billed, 19, 218, 294.

Western, 42.

Grinnell, George Bird, Blue Goose

on Long Island, 222.

Grinnell, Joseph, notice of his 'The Name of the American Barn Swallow, 491; concerning a certain tendency in systematic ornithology, 491.

Griscom, Ludlow, the Starling at

Plattsburg, N. Y., 481.

Grosbeak, British Columbia, Evening, 150.

Black-headed, 153, 235.

Evening, 170-181.

Pine, 241, 355.

Grosbeak, Rose-breasted, 139, 348, 359.

Grouse, Canada Ruffed, 44.
Columbian Sharp-tailed, 44.
Richardson's, 44.
Ruffed, 23.
Sharp-tailed, 75, 376.

Guara alba, 285.

Guiraca cærulea cærulea, 285. Gull, Franklin's, 494.

> Glaucous, 221, 233. Herring, 295. Ivory, 220. Kumlien's, 233. Laughing, 19, 338, 340. Nelson's, 349.

Ring-billed, 241, 340.

Guttera edouardi symonsi, 102.

Gyldenstolpe, Nils, notice of recent papers by, 96.

Gymnopelia cecilioe, 379. c. gymnops, 256. erythrothorax, 379.

Hæmatorus bachmani, 333. palliatus, 338. quoyi, 379. townsendi, 379.

Haliæetus albicilla, 207. a. brooksi, 207.

leucocephalus leucocephalus, 25, 78.

Hapalocercus meloryphus fulviceps, 452.

Harlow, Richard C., notes on the

breeding birds of Pennsylvania and New Jersey, 18-29, 136-147. Harper, Francis, the White-winged

Dove (Melopelia asiatica) in Georgia, 76.

Harris, Harry, uncolored prints from Havell's engravings of Audubon's 'Birds of America,' 29-32.

Hawk, Broad-winged, 24.
Cooper's, 24, 45, 345.
Krider's, 345.
Marsh, 23, 238, 345.
Pigeon, 46, 439.
Red-shouldered, 24.
Red-tailed, 24.
Rough-legged, 45, 351.
Sharp-shinned, 24, 43.
Sparrow, 25, 46, 297, 345.
Swainson's, 45.
Western Redtailed, 45.
Duck, 25.

Hawaii, 349.

Hawkins, Chauncey J., sexual selection and bird song, 421–437.

Hazard, Rowland Gibson, obituary

notice of, 264. Heleodytes balteatus, 456.

fasciatus, 457. Helicolestes, 370. Helinaia swainsoni, 236.

Heliochera rufaxilla, 453. Helmitheros vermivorus, 141, 285. Helodromas solitarius solitarius, 22, 280.

Hemipuffinus, 201. Hemisula, 216.

Hemithraupis guira guira, 461. Herodias egretta, 438.

Heron, Black-crowned Night, 21, 85, 297.

Great Blue, 20, 341. Green, 21, 85, 296. Little Blue, 75. Treganza's Blue, 42.

Yellow-crowned Night, 438, 477.

Herpetotheres cachinnans maestus, 444.

Herpornis xantholeuca interposita, 256.

Herrick, Francis H., review of his 'Audubon the Naturalist,' 86-89.

525

Hesperiohona vespertina brooksi, 150, 209.

v. californica, 209.

v. vespertina, 170-181, 341.

v. warreni, 209.

Heteractitis incanus, 331.

Heterospizias meridionalis, 444.

Himantopus mexicanus, 372.

Hirundo erythrogastra, 140, 154, 212, 348, 491.

e. palmeri, 217.

rustica erythrogastris, 212.

Histrionicus histrionicus, 437.

Hog Cholera distributed by birds, 253, 495.

Hollister, N., notice of his 'The Yellow Rail in the District of Columbia,' 502.

Holt, Ernest G., birds and mulberries, 359.

Howell, A. H., the Rough-legged Hawk (Archibuteo lagopus sanctijohannis) at Washington, D. C., 351; a Crested Flycatcher injured by swallowing a grasshopper, 356.

Hubbs, Carl L., the distribution of Nuttall's Sparrow in California, 321–326.

Hummingbird, Black-chinned, 49. Calliope, 50. Ruby-throated, 28, 79, 346.

Rufous, 49.

Hydrochelidon nigra surinamensis, 483.

Hylocichla aliciæ bicknelli, 486. fuscescens fuscescens, 147, 281,

f. salicicola, 83.

359.

guttata pallasi, 147.

g. polionota, 375.

mustelina, 146, 237, 282, 359. ustulata, 158.

u. swainsoni, 147, 158, 280.u. ustulata, 483.

Hylopezas macularia macconelli, 498.

Hypocnemoides, 370. Hypoxanthus rivolii brevirostris, 450.

IBICTER megalopterus, 443.

'Ibis, The,' reviewed, 99, 255, 376, 498.

Ibis, Glossy, 476.

Icteria virens longicauda, 155.

v. virens, 144, 359.

Icterus bullocki, 150.

galbula, 137, 347, 359.

mesomelas taczanowskii, 459. parisorum, 481.

spurius, 137, 285, 359.

Ictinia mississippiensis, 283.

Ictinaëtus, 255.

Iliornis, 205.

flavipes, 205.

Illinois, 94, 226, 234, 477.

Indiana, 75, 228, 477.

Irena cyanea megacyanea, 102.

Irenidæ, 102.

Iridiprocne bicolor, 140.

Irrisor, 500.

Ispidella, 368.

Ixobrychus exilis, 20, 341.

sinensis astrologus, 501.

Ixoreus nævius nævius, 159.

JACANA spinosa, 206.

s. gymnostoma, 206.

s. violacea, 206.

Jaeger, Long-tailed, 233, 234.

Jay, Blue, 136, 252, 346, 493.

Black-headed, 148.

Florida, Blue, 359.

Rocky Mountain, 149.

Jensen, J. K., subsequent nestings, 83-84; notes on the nesting birds of Wahpeton, North Dakota, 344-349.

Juneo, 486.

aikeni, 357.

caniceps, 211.

dorsalis, 486.

hyemalis carolinensis, 211.

Junco h. connectens, 210.

h. hyemalis, 139, 211, 280, 342,

h. shufeldti, 152, 486. montanus, 486.

oreganus annectens, 211.

o. couesi, 486.

o. mearnsi, 211.

o. montanus, 211.

o. oreganus, 211.

o. pinosus, 211.

o. shufeldti, 211.

o. thurberi, 211.

o. townsendi, 211. phæonotus caniceps, 211.

Junco, Shufeldt's, 152.

Slate-colored, 139, 342, 482. White-winged, 357.

Justice, Henry, obituary notice of, 266.

KALMBACH, E. R., review of his 'The Crow and its Relation to Man.' 246.

Kennard, Frederic H., ferruginous stains on water-fowl, 123-132.

Killdeer, 22, 43, 238, 332, 341, 344. Kingbird, 28, 346.

Cassin's, 493.

Arkansas, 346.

Eastern, 50. Western, 50.

Kingfisher, Belted, 26, 184, 234, 345.

Western Belted, 48.

Kinglet, Golden-crowned, 146, 369. Ruby-crowned, 58, 344.

Western Golden-crowned, 158.

Kittiwake, 294.

Knot, 328.

LABRADOR, 367.

Lamb, Charles R., Massachusetts notes, 233.

Lanivireo flavifrons, 141, 284. solitarius alticola, 441.

Lanivireo s. cassini, 155. s. solitarius, 141, 285, 343.

Lanius borealis, 154.

b. invictus, 212.

ludovicianus excubitorides, 154, 348.

1. ludovicianus, 280.

migrans, 140, 237.

Lark, Desert Horned, 239. Dusky Horned, 148.

Pallid, 148.

Prairie, Horned, 136.

Larus affinis, 201.

argentatus, 220, 295.

a. thayeri, 201.

atricilla, 19, 201, 338, 340.

a. megalopterus, 201.

delawarensis, 240, 241.

fuscus affinis, 201.

glaucescens, 350.

hyperboreus, 221, 233.

h. barrovianus, 472.

h. hyperboreus, 467.

kumlieni, 220, 233.

leucopterus, 220.

nelsoni, 349.

ridibundus, 201.

thayeri, 201.

Legge, Col. W. V., obituary notice of, 510.

Leopold, Nathan F., Jr., Yellowcrowned Night Heron at Chicago,

Lepidopyga goudoti zuliæ, 366.

Leptophaethon, 202.

catesbyi, 202.

Leptopogon superciliaris poliocephalus, 454.

s. transandinus, 454.

Leptoptila intermedia, 256.

Leptositta, 213.

Leptotila decolor, 447.

Leucopolius, 205.

alexandrinus nivosus, 205.

Leucotreron epia, 379. gularis, 379.

Limogeranus americanus, 204. Limosa, 204.

fedoa, 330.

Linurgus elgonensis, 502.

Lioptilus alyssinicus ansorgei, 498. Lloyd, Hoyes, the extraction of fat

from bird-skins, 164–169.

Lincoln, F. C., the Harpy Eagle in Colorado, 78; notes on some species new to the Colorado list of birds, 236; notice of his 'The Woodpeckers of Colorado,' 368.

Lobipes lobatus, 75, 327.

Lochmias nematura castanonota, 498.

Longspur, Chestnut-collared, 238. Lapland, 342.

Loomis, Leverett M., review of his, 'A Revision of the Albatrosses, Petrels, and Diving Petrels', 362-364.

Loon, 19, 294.

Red-throated, 219, 235.

Lophodytes cucullatus, 20, 295. Lophortyx californica catalinensis, 206.

Loxia curvirostra bendirei, 209. c. minor, 137, 225, 281, 301. leucoptera, 236, 301, 342.

McAtee, W. L., early bird records for the vicinity of Washington, D. C., 85; cause of the "fishy" flavor of the flesh of wild ducks, 474; review of his 'A Sketch of the Natural History of the District of Columbia, 366; notice of his 'Attracting Birds to Public Parks, 474-476.

McGregor, Richard C., notice of his 'New or Noteworthy Philippine Birds, II.' 370.

McHatton, Henry, obituary notice of, 107.

Macreuse, 499.

Macrorhamphus griseus scolopaceus, 235, 328.

Magpie, 148, 493.

Maine, 170-181, 220, 224, 353.

Man-o'-war-bird, 338.

Marcres, George M., an attempt to breed the Pine Grosbeak in captivity, 255.

Mareca americana, 42, 340.

penelope, 75.

Margarops fuscatus fuscatus, 339. Marila affinis, 20.

Martin, Purple, 140, 301, 348.

Massachusetts, 37–40, 75, 80, 81, 82, 182–185, 219, 223, 224, 225, 233, 234, 405–416, 482.

Mathews, Gregory M., notice of his 'The Birds of Australia,' 97, 246, 368, 490.

Meadowlark, Western, 149, 238, 347.

Mearns, Edgar Alexander, biographical sketch of, 1-18.

Melanerpes erythrocephalus, 27, 84, 232, 285, 299, 341, 345, 359.

Melanoperdix nigra borneensis, 100. Meleagris gallopavo, 358.

g. silvestris, 23.

Melopelia asiatica asiatica, 76.

Melospiza georgiana, 139, 282.

lincolni gracilis, 211. l. lincolni, 342.

l. striata, 211.

melodia fallax, 211.

melodia faliax, 211.

m. inexpectata, 187, 211.m. melodia, 139, 283, 347, 359.

m. merrilli, 153.

m. montana, 211.

m. phæa, 350.

m. saltonis, 211.

Merganser, 20, 42.

American, 295.

Hooded, 20, 295.

Red-breasted, 183, 295.

Mergus americanus, 20, 42, 295. serrator, 183, 295.

Meriden Bird Club, notice of its third report, 96.

Merwin, Mabel Melcalf, Common Tern nesting at Thousand Islands, 74.

'Messager Ornithologique,' viewed, 101.

Mexico, 248.

Michigan, 75, 350, 489.

Micralcyone pusilla yorki, 368.

Microhierax, 255.

Micrositta, 213.

Migration, 484, 492.

Miller, Richard F., nesting of the Bittern (Botaurus lentiginosus) in the Delaware Valley, 477; early nesting of the Northern Pileated Woodpecker in Pennsylvania, 479.

Miller, W. DeW., Megaceryle vs. Streptoceryle, 352; the systematic position of Calyptophilus, 356; relative length of the intestinal cæca in Trogons, 480.

Micrastur plumbeus, 376.

Milvago chimango, 376.

Mimus longicaudatus punensis, 456. polyglottos polyglottos, 144, 229, 282, 359.

Mionectes striaticollis poliocephalus, 454.

Mirafra africanoides harei, 102. Mixornis capitalis, 503.

rubricapilla connectens, 376.

Mniotilta varia, 141, 280.

Mockingbird, 144, 229.

Moffett, L. I., see Gee, N. Gist. Molothrus ater ater, 137, 347.

a. artemisiæ, 149, 209.

bonariensis occidentalis, 459.

Montana, 492.

Monticola rufocinerea sclateri, 258. Morss, Charles B., King Rail (Rallus elegans) in Massachusetts. 223.

Morus, 203.

bassanus, 203.

Mousley, H., the breeding of the Migrant Shrike at Hatley, Stanstead County, Quebec, 1916, 33-36; Labrador and Acadian Chickadees at Hatley, Stanstead County, Quebec, 83; uncommon at Hatley, birds Stanstead County, Quebec, 84; subsequent nestings, 237; unusual dearth of winter birds, 241; further notes and observations on the birds of Hatley, Stanstead County, Quebec, 1916-1917, 289-310.

Moustache, 499.

Mullens, W. H. and Swann, H. Kirk, notice of their 'A Bibliography of British Ornithology,' 98.

Munroe, J. A., Short-eared Owl (Asio flammeus) eating birds, 223; notes on some British Columbia birds, 234.

Murphy, Robert C., notice of his 'Natural History Observations from the Mexican Portion of the Colorado Desert,' 248; notice of his 'A Study of the Atlantic Oceanites,' 364.

Murre, Brünnich's, 241, 294, 340.

Myadestes townsendi, 158. Mycteria americana, 285.

Myiarchus atriceps, 455.

cephalotes, 455.

crinitus, 28, 284, 346, 354, 359, 439.

crinitus residuus, 208.

ferox phæocephalus, 453.

semirufus, 455.

tyrannulus chlorepiscius, 455. Myiobius villosus, 455.

Myiobius cinnamomeus cinnamomeus, 455.

Myioborus verticalis verticalis, 458. Myiochanes fumigatus ardesiacus, 455.

punensis, 455.

richardsoni richardsoni, 51. virens, 28, 283, 346.

Myiophobius fasciatus saturatus, 455.

Myiospiza aurifrons, 462.

Myiotheretes striaticollis, 453.

Myiozetetes similis connivens, 454.

Myrmophila vavasoori, 498.

Nannus hiemalis hiemalis, 145, 156. National Parks, birds of, 492. Nemospiza, 210.

henslowi henslowi, 210.

h. occidentalis, 210.

Neoleucotreron, 370.

Neonannodes chrysostomus cyanopterus, 246.

Neonectris, 216.

Nephœcetes niger guadeloupensis, 366.

Nettion carolinense, 20, 42, 281.

New Jersey, 18-29, 81, 136-147,

227, 231, 477, 484.

New Mexico, 223, 357, 483. New York, 38, 74, 222, 481.

Newfoundland, 248.

Nichols, John T., concerning Brewster's Warbler, 82; notice of his 'An Aspect of the Relation between Abundance, Migration and Range in Birds,' 492.

Nighthawk, 28. Pacific, 49.

Noble, G. K., see Bangs, Outram. Norton, Arthur H., the Evening Grosbeak (Hesperiphona vespertina) in Maine, with remarks on its distribution, 170–181; the Ivory Gull (Pagophila alba) at Portland, Maine, 220; the Starling (Sturnus vulgaris) at Portland, Maine, 224; obituary notice of Prof. Jonathan Young Stanton, 511.

North Dakota, 83, 227, 344-349, 350, 476.

Nucifraga columbiana, 149.

Numenius americanus, 43, 188, 331.

a. americanus, 188, 350.

a. occidentalis, 191.

a. parvus, 192.

arquatus, 205.

hudsonicus, 331, 438.

Numida papillosa damarensis, 102.

Nutcracker, Clarke's, 149.

Nuthatch, Pygmy, 157.

Red-breasted, 146, 157, 343, 491.

Slender-billed, 157.

White-breasted, 146, 492.

Nuttallornis borealis, 28, 51.

Nyctanassa violacea, 438, 477.

Nyctea nyctea, 47, 299, 372.

Nyctibius griseus cornutus, 450.

Nycticorax nycticorax nævius, 21, 85, 284, 297.

Nyctidromus albicollis albicollis, 450.

Nye, Harriet A., the Sapsucker wintering in central Maine, 353. Oberholser, Harry C., a revision of the races of Toxostoma redivivum (Gambel), 52-61; notes on North American birds 62-65, 185-187, 463-467, notes on the subspecies of Numenius americanus Bechstein, 188-195; third annual list of proposed changes in the A. O. U. Check-List of North American Birds, 200-217; Solitary Sandpiper (Tringa solitaria solitaria) in New Mexico, 223;

Philadelphia Vireo (Vireosylva philadelphica) in North Dakota

in summer, 227; Prothonotary

Warbler (Protonotaria citrea) in New Jersey, 227; Larus nelsoni in juvenal plumage from the Hawaiian Islands, 349; Anas rubripes rubripes in North Dakota, 350; Numenius americanus not a breeding bird of Michigan, 350; Junco aikeni in New Mexico, 357: the subspecies of Larus hyperboreus Gunnerus, 467-474; Cinnamon Teal (Querquedula cyanoptera) in North Dakota, 476; the subspecific name of the Glossy Ibis, 476; Picoides arcticus in Florida, 479; the range and status of Aphelocoma californica hypoleuca Ridgway, 480; the northernmost record of Icterus parisorum, 481; Russet-backed Thrush (Hylocichla ustulata ustulata) in New Mexico, 483; the status of Buteo platypterus iowensis, 476; notice of his, 'A Review of the Subspecies of the Leach Petrel,' 95; notice of his, 'Birds Collected by Dr. W. L. Abbott on Various Islands in the Java Sea.' 95: notice of his 'The Birds of the Anumba Islands,' 95.

Oceanicus, 85.
Oceanodroma beali, 95, 202.
beldingi, 95.
hornbyi, 202.
kædingi, 95.
leucorhoa, 85, 95.
l. beali, 202.
monorhis socorroensis, 202.
Ocreatus cissiurus cissiurus, 451.
Oena capensis aliena, 258.
Oidemia americana, 296.
deglandi, 476.
perspicillata, 85.
Olor columbianus, 42, 222.

Olor columbianus, 42, 222. 'Oologist, The,' reviewed, 99, 255, 376, 497.

Oporornis agilis, 442.
formosus, 143, 484.
philadelphia, 144, 232.
tolmiei, 155.
Oreoica cristata lloydi, 100.
Oriole, Baltimore, 137.
Bullock's, 150.
Orchard, 137.
Oriolus luteolus thaiacus, 377.
Ornithological Articles in other journals, 101, 255, 376, 501.
Osprey, 25, 46.
Ostinops alfredi alfredi, 459.

Otocompsa flaviventris minor, 376.
Otocoris alpestris, arcticola, 148.
a. merrilli, 148
a. praticola, 136.

a. praticola, 136.
Otus asio asio, 26, 298, 345.
a. cinerascens, 217.
a. gilmani, 217.

a. macfarlanei, 47. roboratus, 448. Owl, Barn, 25. Barred, 26.

Barred, 26.
Burrowing, 47.
California Pygmy, 48.
Great Horned, 26, 298, 351, 372, 478.
Great Gray, 47, 298, 372.
Hawk, 299.
Labrador Horned, 233.

345.

Macfarlane's Screech, 47.

Northern Spotted, 235.

North-western Horned, 47.

Richardson's, 298.

Saw-whet, 26, 47, 298, 351.

Screech, 26, 298.

Long-eared, 25, 46, 183, 297,

Snowy, 47, 299. Short-eared, 25, 46, 223, 238, 298, 345.

Oxyechus vociferus, 22, 43, 283, 332, 341, 344.

Western Horned, 47.

Oyster-catcher, 338. Black, 333. PAGOPHILA alba, 85, 201, 220. eburnea, 201.

Palæochenoides mioceanus, 251. Palmer, T. S., thirty-fifth stated meeting of the American Ornithologists' Union, 65-73; obituary notice of Lyman Belding, 106; ornithological work in 1917, 107-110; the list of fellows of the A. O. U., 110; called to the colors, 111, 267, 385, 513; Goudot's explorations in Colombia, 240; foreign members of the A. O. U., 266; obituary notice of Harry Reed Taylor, 382; the principal ornithological societies, 382-384; members of the A. O. U., 384; endowment of ornithological so-

A. O. U., 513. Pandion haliætus carolinensis, 25, 46.

cieties, 384; associates of the

Parasula, 203.

nebouxii, 203.

cyanops cyanops, 203.

Pardirallus rytirhynchus rytirhynchus, 446.

Parisoma blanfordi distincta, 258. Partridge, Hungarian, 43.

Parus flavipectus carruthersi, 256.

Passer domesticus, 347.

d. hostilis, 151, 210.

Passerculus princeps, 232, 342, 440. sanwichensis alaudinus, 151.

s. savanna, 138, 232.

Passerella iliaca altivagans, 186, 211.

i. iliaca, 236, 282.

i. monoensis, 99, 211.

i. schistacea, 153.

Passerherbulus, 210.

caudacutus, 138, 284.

henslowi henslowi, 138, 484.

lecontei, 347, 441.

maritimus maritimus, 138.

nelsoni nelsoni, 210.

Passerherbulus n. subvirgatus, 210. Passerina amcena, 153.

ciris, 281.

cyanea, 139, 280, 359.

Patagicenas squamosa, 339.

Patagona gigas peruviana, 451.

Paxson, Henry D., review of his 'The Last of the Wild Pigeon in Bucks County, Pa., 95.

Pearson, T. Gilbert, review of his 'Birds of America,' 89-91; notice of his 'Tales from Birdland,' 367. Pediœcetes phasianellus campestris,

75.

p. columbianus, 44.

p. jamesi, 206.

p. phasianellus, 376.

Pelagodroma marina, 202.

m. hypoleuca, 202.

Pelican, Brown, 512.

Pelidna alpina sakhalina, 329.

Penard, Thomas E., Starlings at Barnstable Mass., 80; see also Bangs, Outram.

Penelope brooki, 100.

Pennsylvania, 18-29, 75, 82, 83, 95, 136-147, 218, 221, 230, 479.

Penthestes atricapillus atricapillus, 146, 465.

a. septentrionalis, 157.

carolinensis carolinensis, 146, 281, 465.

gambeli abbreviatus, 379.

g. baileyi, 379.

g. gambeli, 157.

g. inyoensis, 379.

hudsonicus, 343.

h. columbianus, 214.

h. hudsonicus, 37.

h. littoralis, 37, 83, 306.

h. nigricans, 37, 83, 230, 305.

h. subsp.?, 230, 231, 343.

rufescens rufescens, 158.

Perdix perdix, 43.

Perisoreus canadensis capitalis, 149. obscurus rathbuni, 209.

Perissolalage chalepa, 95. Perry, E. M. and W. A., home life of the Vesper Sparrow and the Hermit Thrush, 310-321. Peru, 442-463. Peters, James L., notice of his 'Birds from the Northern Coast of the Dominican Republic,' 96. Petrochelidon lunifrons lunifrons, 140, 153, 348. Peucæa æstivalis bachmani, 223, 284. Pewee, Western Wood, 51. Wood, 28, 346. Pezoporus formosus, 377. Phacellodomus rufifrons, 453. Phæomyias murina tumbezana, 454. Phæopus, 205. borealis, 205. hudsonicus, 205. phæopus phæopus, 205. tahitiensis, 205. Phaëthon, 202. Phalacrocorax africanus pictilis. auritus auritus, 340. a. floridanus, 357. carbo, 203. c. americanus, 203. vigua vigua, 443. Phalarope, Northern, 75, 327, 372. Red, 327. Wilson's, 327, 372. Phalaropus fulicarius, 327. Pharomachrus auriceps, 450. mocinno, 480. Phasianus, 258. torquatus, 44. Pheasant, Ring-necked, 44. Pheugopedius sclateri, 457. Pheuticus chrysogaster, 462. Philippines, 370.

Philohela minor, 22.

p. picinus, 48.

Phlæotomus pileatus abiticola, 27,

Phœbe, 28. Say's, 50. Phœnicophilis, 356. Phœniculus, 500. Phœnicurus frontalis sinæ, 498. Phrygilus alaudinus, 462. ocularis, 462. Phyllastrephus terrestris rhodesiæ, 102. Piava cavana nigricrissa, 448. Pica pica hudsonia, 148. Picoides americanus, 48. arcticus, 48, 85, 299, 479. Picolaptes warscewiczi, 453. Picumnus lafresnayei, 450. Piezorhina cinerea, 462. Pigeon, Scaled, 339. Wild, 23-95, 416-420. Pigeons, Carrier, protection of, 253. Pinicola enucleator kamtschathensis, 209. e. leucura, 355. Pintail, 238. Pionus corallinus, 448. Pipilo crissalis, 376. c. carolæ, 211. erythrophthalmus canaster, 359. e. erythrophthalmus, 139, 280. maculatus curtatus, 153. Pipit, 156, 304. Pipra erythrocephala berlepschi, 453. Piranga, 499. erythromelas, 140, 284, 359, 485. ludoviciana, 153. rubra rubra, 226, 359. testacea tschudii, 461. t. desidicsa, 461. Piscatrix, 202. sula, 203. Pisobia bairdi, 42, 329. damacensis, 204. maculata, 280, 329, 341.

minutilla, 329.

Pisobia m. subminuta, 204.
Pithecophaga jeffreyi, 370.
Planesticus fredericki, 377.
fumigatus abariensis, 377.
f. ochro-fulvescens, 377.
merula merula, 214.

migratorius caurinus, 214. m. migratorius, 147, 282, 349. m. propinquus, 158.

Platycercus elegans fleuriensis, 246. Plectrophenax nivalis, 85.

Plegadis autumnalis, 476. falcinellis, 476.

Plover, Black-bellied, 331. Golden, 43, 332. Piping, 23. Semipalmated, 332.

Snowy, 332.

Upland, 22, 43.

Podargus strigoides centralia, 368.
s. capensis, 368.

s. capensis, 368.

Podilymbus podiceps, 19, 218, 294.

Polioptila anteocularis maior, 456.

bilineata bilineata, 456.

cærulea cærulea, 146, 285, 484.

plumbea, 214.

p. margaritæ, 214.

Polyborus cheriway auduboni, 443. c. cheriway, 443.

Pomatostomus ruficeps parsonsi, 377.

Poœcetes gramineus confinis, 151. g. gramineus, 138, 280, 342, 347.

Porter, Louis H., Connecticut notes, 232.

Porto Rico, 333-340. Porzana carolina, 21.

Prairie Chicken, 245, 276. Lesser, 236.

Prinia inornata herberti, 256. Priofinus cinereus, 202.

Priotelus temnurus, 480.

t. temnurus, 286.

Procellaria æquinoctialis, 202. cinerea, 202.

Procellaria diabolica, 202. Progne subis subis, 140, 282, 301, 348.

Protonotaria citrea, 227, 285.

Psalidoprymna gouldi chlorura, 451. Psaltriparinæ, 214.

Psaltriparus minimus saturatus, 214.

Psephotus, varius, 97.

v. thelæ, 97.

v. orientalis, 97.

Pseudocolaptes boisonneautii meridæ, 258.

Psittacula cœlestis cœlestis, 448.

Pterodroma gularis, 221.

fisheri, 222.

Pterylosis, 113-340, 416-420.

Ptiloseelys resplendens, 446.

Publications Received, 102, 259, 379, 503.

Puffinus assimilis, 201, 215.

a. baroli, 215.

a. godmani, 201.

auricularis, 215.

carneipes, 201.

couesi, 215.

griseus, 85, 233, 437.

kuhlii borealis, 201, 215.

k. flavirostris, 215.

opisthomelas, 215.

pacificus alleni, 202.

sphenurus, 202.

Pulsatrix perspicillata perspicillata, 449.

Pygochelidon cyanoleuca, 458. Pyrocephalus rubineus heterurus,

Pyrrhura erythaca wilderi, 370.

QUAIL, 251.

455.

Quebec, 33-36, 83, 84, 222, 289-310.

Querquedula cyanoptera, 476.

discors, 235, 296.

Quiscalus æneus, 440.

aglæus, 440.

quiscula æneus, 137, 347.

Quiscalus q. aglæus, 283. q. quiscula, 137. q. versicolor, 440.

RAIL, Black, 21. Clapper, 21. King, 21, 223. Virginia, 21.

Rallus elegans, 21, 223. crepitans, 21. longirostris caribæus, 216. virginianus, 21, 281.

Ramphocelus carbo connectens,461. Raven, Mexican, 149. Northern, 136.

Recurvirostra americana, 235, 327. Redpoll, 150, 232, 241. Redstart, 144, 155.

Regulus calendula calendula, 158, 284, 344.
regulus olivaceus, 186, 214.

r. satrapa, 186, 214.satrapa satrapa, 146, 214, 282.s. olivacea, 214, 158.

Remiz, 500. Remizinæ, 214.

Rett, E., Downy Woodpecker in Colorado, 223; the Canada Warbler again in Colorado, 229.

'Revue Française d'Ornithologie' reviewed, 100, 257, 378, 501.

Richmond, Charles W., in memoriam: Edgar Alexander Mearns, 1–18; appointed Associate Curator of Birds U. S. Nat. Museum, 512.

Rhipidura, 377.

Rhoads, Samuel N., Georgia's rarities further discovered in a second American portfolio of John Abbot's bird plates, 271–286.

Rhode Island, 37–40.
Rhopias spodionota juninensis, 498.
Rhothonia, 249.
Rhyacophilus glareola, 216.

g. affinis, 216.

Rhynchodon, 207.

peregrinus anatum, 207. p. peali, 207.

p. peregrinus, 207. Rhynchofalco, 207.

fuscocæruleus septentrionalis, 207.

Richmondena, 499.

Riley, J. H., a winter record of Bewick's Wren from northern Virginia, 483; notice of his 'A New Bullfinch from China,' 370. Riparia riparia, 140, 154, 348. Rissa tridactyla, tridactyla, 294

Rissa tridactyla tridactyla, 294. Robin, 147, 231, 349, 493.

Western, 158.

Rogers, Charles H., Horned Grebe rising from the ground, 218.

Rothrock, Boyd P., Little Blue Heron in Pennsylvania, 75; Willow Thrush in Pennsylvania, 83. Rupornis magnirostris occidua, 444. Rynchops nigra, 19.

Sage, John H., obituary of R. G. Hazard, 264.

Sage Hen, 44.

Salpinctes obsoletus obsoletus, 156. Saltator striatipectus peruvianus, 463.

Sandpiper, Aleutian, 328.
Baird's, 42, 329.
Buff-breasted, 331.
Least, 329.
Pectoral, 329, 341.
Purple, 233.
Solitary, 22, 223, 229.
Spotted, 22, 43, 331.

Red-backed, 329. Spoon-billed, 387–404. Western, 329

Western, 329. Santo Domingo, 96.

Sapsucker, Red-naped, 48. Yellow-bellied, 27, 341, 353. Williamson's, 48.

Saskatchewan, 238-240.

Saunders, Aretas A., some recent Connecticut bird notes, 340-344; a note concerning bird mortality, 358.

Sayornis nigricans angustirostris, 455.

> phœbe, 28, 281. sayus, 50.

\* Scæophaethon, 202.

rubricaudus, 202.

Scapaneus melanoleucus, 450.

Schorger, A. W., European Widgeon, at Madison, Wis., 74.

Sclateria nævia trinitatis, 258.

Scoter, American, 296.

White-winged, 476.

Scotiaptex, 217.

nebulosa lapponica, 217.

n. nebulosa, 47, 298.

Scytalopus symonsi, 256.

Seiurus aurocapillus, 143, 284.

a. furvior, 248.

motacilla, 143.

noveboracensis notabilis, 155. n. noveboracensis, 143, 283, 304.

Selasphorus rufus, 49.

Serinus mozambicus tando, 498. m. aurifrons, 498.

Serpophaga cinerea cana, 453.

Setophaga ruticilla, 144, 155, 285.

Shearwater, Sooty, 233, 437.

Shoveller, 42, 74, 372.

Shrike, Migrant, 140, 237.

Northern, 154, 241.

White-rumped, 83, 154, 348.

Shufeldt, R. W., notes on some fossil bird from Florida, 257; notice of his 'Fossil Birds found at Vero, Florida, with Descriptions of New Species,' 249.

Sialia currucoides, 159.

mexicana occidentalis, 159. sialis episcopus, 215.

s. sialis, 147, 282, 349.

Siberia, 196-199, 387-404.

Sicalis flaveola, 462. Sight Records, 262.

Simmons, E. A., White-winged

Scoter (Oidemia deglandi) in South Carolina, 476.

Siptornis cisandina, 453.

Siskin, Pine, 138, 151, 241, 484.

Sitta atkinsi littorea, 217.

carolinensis carolinensis, 146, 213, 283.

c. aculeata, 157.

c. cookei, 213.

c. tenuissima, 375.

canadensis, 146, 157, 343.

pygmæa pygmæa, 157.

pusilla, 281.

Skimmer, Black, 19.

Skinner, M. P., notice of his 'List of Birds of Yellowstone National

Park,' 493. Snipe, Wilson's 22, 42, 328.

Solitaire, Townsend's, 158.

Song, Bird, 421-437.

Soper, J. Dewey, flight of Horned Owls in Canada, 476; notice of his 'The Birds of Edmonton,' 489.

Sora, 21.

Souchet, 499.

'South Australian Ornithologist' reviewed, 257, 500.

South Carolina, 437-442, 476.

Spatula clypeata, 42.

Sparrow, Bachman's, 226.

Brewer's, 152.

Chipping, 139, 251, 347.

Clay-colored, 347.

English, 151, 251, 347.

Field, 139, 358.

Fox, 236.

Gambel's, 151.

Grasshopper, 138, 347.

Ipswich, 232, 342, 440.

Henslow's, 138, 484.

Lark, 138.

Leconte's, 347, 441.

Sparrow, Lincoln's, 342. Merrill's, Song, 153. Nuttall's, 321-326. Sage, 152. Savannah, 138, 232. Seaside, 138. Sharp-tailed, 138. Slate-colored Fox, 153. Song, 139, 347, 359. Swamp, 139. Vesper, 138, 310-316, 342, 347. Western Chipping, 152. Western Field, 236, 347. Western Grasshopper, 151. Western Lark, 151. Western Savannah, 151. Western Tree, 152. Western Vesper, 151. White-crowned, 342. White-throated, 138, 232. Spectyto cunicularia floridana, 207. c. hypogæa, 47. c. minor, 365. c. punensis, 449. floridana, 207. Sphecotheres, 499. Sphyrapicus ruber, 79, 217. thyroideus, 48. t. nataliæ, 208. varius nuchalis, 48. v. ruber, 217. v. varius, 27, 341, 281. Spinus ictericus peruanus, 461. pinus, 138, 484. p. pinus, 151. simonsi, 102. Spiza americana, 348. Spizella breweri, 152. monticola, 502. m. ochracea, 152. pallida, 347. passerina arizonæ, 152.

p. passerina, 139, 285, 349.

pusilla arenacea, 236, 347.

Sporophila gutturalis inconspicua,

pusilla pusilla, 139, 358.

462.

Sporophila simplex, 462. Sporothraupis cyanocephala cyanocephala, 348. Squatarola squatarola, 331. Stanton, Jonathan Y., obituary notice of, 511. Starling, 80, 136, 224, 409, 481, 485. Steganopus tricolor, 327, 372. Stelgidopteryx ruficollis uropygialis, serripennis, 140, 154, 348. Stellula calliope, 50. Stercorarius longicaudus, 233, 234. Sterna anætheta, 338. antillarum, 19. caspia, 182. dougalli, 182. fuscata, 215. hirundo, 19, 74. Sterrhoptilus, 503. Stilt, Black-necked, 372. Witmer, Yellow-headed Stone, Blackbird in New Jersey, 81; Glaucous Gull (Larus hyperboreus) at Philadelphia, 221; correction, 242. Street, J. Fletcher, Hudsonian Chickadee on the Pocono Mountain, Pa., 230. Streptoceryle, 352, 463. aleyon caurina, 48, 463. Strix, 217. occidentalis caurina, 235. varia varia, 26. Strong, Reuben M., the description of the voice of birds, 133-135; the song of Bachman's Sparrow (Peucæa æstivalis bachmani) 226; notice of his 'Some Observations on the Origin of Melanin Pigment in Feather Germs,' 97. Stuart, G. H. 3rd., Brewster's Warbler in Pennsylvania, 82. Sturnella magna argutula, 280. neglecta, 149, 347. n. confluenta, 209.

Sturnus vulgaris, 80, 224, 481, 485.

Sturnus v. vulgaris, 136. Suavipsitta, 246. Sula, 203.

dactylatra californica, 216. leucogastra, 337. piscator, 203, 337.

Surf-bird, 332.

Surnia ulula caparoch, 299.

Swales, B. H., Northern Phalarope (Lobipes lobatus) in Michigan, 75.

Swallow, Bank, 140, 154, 348.
Barn, 140, 154, 348.
Cliff, 140, 153, 348, 494.
Northern Violet-green, 154.
Rough-winged, 140, 154, 348.
Tree, 140.

Swan, Whistling, 42, 222.

Swarth, H. S., review of his 'The Pacific Coast Jays of the Genus Aphelocoma,' 250.

Swarth, H. S., and Bryant, H. C., review of their 'A Study of the White-fronted Geese in California,' 94.

Swift, Chimney, 28, 346. Vaux's Swift, 49, 235. White-throated, 235.

Sylvia deserticola maroccana, 100. Synallaxis maranonica, 453.

stictithorax, 453. unirufa meridana, 258. Systema Avium, 509.

TACHYCINETA thalassina lepida, 154. Tachyphonus rufus, 461.

Tachytriorchis, 207.
albicaudatus sennetti, 207.

Tanager, Scarlet, 140, 485. Summer, 226.

Western, 153.
Tanagra taczanowskii, 459.
xanthogaster quitensis, 459.

Tangara argentea fulvigula, 460.
chilensis, 459.
cyaneicollis cæruleocephala,
460.
gyroloides, 490.

Tangara g. bangsi, 490. g. catharinæ, 459. g. nupera, 490. pulchra pulchra, 459. parzudakii florentes, 459. venusta, 460.

Tapera nævia nævia, 448. Taraba melanura debilis, 452. Tatler, Wandering, 331.

Taylor, Harry Reed, obituary notice of, 382.

Taylor, Walter P., Bohemian Waxwing (Bombycilla garrula) breeding within the United States, 226.

Teal, Blue-winged, 235, 296. Cinnamon, 476.

Green-winged, 20, 42, 372.

Telmatodytes palustris, 284. p. æstuarinus, 213. p. palustris, 146. p. plesius, 156.

Tennessee, 93. Tern, Black, 483.

Bridled, 338. Caspian, 182.

> Common, 19, 74. Least, 19.

> Noddy, 338, 507.

Roseate, 182. Sooty, 507.

Thalassidroma hornbyi, 202. hypoleuca, 202.

Thamnophilus bernardi baroni, 258. doliatus tobagensis, 258. punctatus interpositus, 258. radiatus variegaticeps, 452.

Thaumasius taczanowskii fractus, 451.

Thlypopsis inornata, 461. Thrasaetus harpyia, 77–79.

Thrasher, Brown, 145, 349. Pearly-eyed, 339.

Thraupis celestis major, 460. cana quæsita, 460.

darwini læta, 460. Thrush, Bicknell's, 486.

Hermit, 147, 158, 316-321.

Thrush, Olive-backed, 147, 158.

Russet-backed, 145, 483.

Willow, 83.

Wood, 146, 237.

Varied, 159.

Thryomanes bewicki bairdi, 212.

b. bewicki, 483, 485.

b. eremophilus, 212.

b. drymæcus, 213.

b. marinensis, 213.

b. nesophilus, 213.

b. catalinæ, 213.

b. leucophrys, 213.

leucophrys, 213.

Thryospiza, 210.

maritima fisheri, 210.

m. macgillivraii, 210.

m. maritima, 210.

m. peninsulæ, 210.

m. sennetti, 210.

nigrescens, 210.

Thryothorus ludovicianus ludovicianus, 145, 280, 359.

Thyellodroma, 202.

bulleri, 202.

cuneata, 202.

Tinnunculus, 207.

columbarius æsalon, 207.

c. columbarius, 207.

richardsoni, 207.

suckleyi, 207.

Titmouse, Tufted, 146, 343.

Todd, W. E. Clyde, obituary notice of, Dr. Robert Latshaw Walker, 511.

Totanus flavipes, 330.

fuscus, 379.

maculatus, 379.

melanoleucus, 22, 43, 205, 280, 330.

Towhee, 139.

Nevada, 153.

Townsend, Charles W., Ipswich bird notes, 182-185; a winter crow roost, 405-416; review of his 'In Audubon's Labrador,' 267.

Toxostoma redivivum, 52-61.

r. helvum, 60.

r. pasadenense, 52, 54.

r. redivivum, 52.

r. sonomæ, 56.

rufum, 145, 282, 349, 359.

Tringa canutus, 328.

solitaria solitaria, 223.

Tringinæ, 204.

Trochilus colubris, 79.

Troglodytes aedon aedon, 145, 305.

a. parkmani, 156, 349.

musculus albicans, 457.

m. chapmani, 244.

m. neglectus, 244.

neglectus, 244.

Trogon melanocephalus, 480.

viridis. 287.

Trogons, 480.

Trogonurus collaris, 451.

curucui, 480.

mexicanus, 480.

puella, 480.

elegans, 480.

Trotter, Spencer, Pied-billed Grebe (Podilymbus podiceps) in Chester

Co., Pa., in summer, 218.

Trupialis bellicosa, 459. Tryngites subruficollis, 331.

Turdus chiguaneo conradi, 456.

gigas gigantodes, 456.

maculirostris, 456.

maranonicus, 456.

reevei, 456.

Turkey, Wild, 23, 358.

Turnstone, 439.

Black, 333.

Ruddy, 332, 341.

Turtur affer sclateri, 256.

Tympanuchus americanus, 345.

pallidicinctus, 236.

Tyranniscus uropygialis, 454.

Tyrannus melancholicus melancholicus, 455.

> tyrannus, 28, 50, 284, 346, 359. verticalis, 50, 346.

Tyto alba alba, 464.
a. contempta, 449.
a. guttata, 464.
a. pratincola, 464.
perlata, 464.

URIA lomvia lomvia, 294, 340. Uroaëtus audax, 257. Urospatha martii olivacea, 366. Utah, 490.

Veery, 142.

Venilornis agilis, 450.
callonotus major, 450.

Vermivora bachmani, 228, 441.
celata orestera, 212.
chrysoptera, 83, 142.
leucobronchialis, 82.
luciæ, 237.
peregrina, 232, 303, 343.
pinus, 82, 141, 283, 482, 485.
rubricapilla guturalis, 155.
r. rubricapilla, 142, 302.

Vetola, 204.
hæmastica, 205.

lapponica baueri, 205.
Vireo, Blue-headed, 141, 343.
Cassin's, 155.
Mountain Solitary, 441.
Philadelphia, 227.
Red-eyed, 141, 154, 252, 348, 493.
Warbling, 141.

Western Warbling, 154. White-eyed, 141. Yellow-throated, 141.

Vireo bellii arizonæ, 212. griseus griseus, 141, 279.

griseus griseus, 141, 279.
Vireosylva chivi griseibarbatus, 457.
gilva gilva, 141.
g. swainsoni, 154.
josephæ josephæ, 458.
olivacea, 141, 154, 252, 285,
348, 359.
philadelphica, 227.

Virginia, 483.

Volatinia jacarini splendens, 462. Volvocivora koratensis, 376. Vulture, Black, 233, 477. Turkey, 23, 45, 84, 297, 341.

WARBLER, Audubon's, 155. Bachman's, 228, 441. Bay-breasted, 343. Black and White, 141. Blackpoll, 82, 303. Black-throated Blue, 80, 142. Black-throated, Green, 143, 441. Blackburnian, 143. Blue-winged, 141, 482, 485. Brewster's, 82. Calaveras, 155. Connecticut, 442. Canada, 144, 229. Cape May, 303, 343. Cerulean, 142. Chestnut-sided, 142. Golden-winged, 142. Hooded, 144. Kentucky, 143, 484. Lucy's 237. Macgillivray's, 155. Magnolia, 142, 441. Mourning, 144, 232. Nashville, 142, 302. Northern Parula, 142, 228. Palm, 232. Pileolated, 155. Prairie, 143, 343. Pine, 143. Prothonotary, 227. Swainson's, 236. Sycamore, 485. Tennessee, 232, 303, 343. Townsend's, 155. Worm-eating, 141. Yellow, 142, 155, 348. Yellow Palm, 283. Warblers, 484. Walker, Robert L., obituary notice

of, 511.

Washington, 40-51, 148-159, 226, 326-333.

Water-Thrush, 143, 304.

Grinnell's, 155.

Louisiana, 143.

Waxwing, Cedar, 140, 154. Bohemian, 81, 154, 226.

Wayne, Arthur T., some additions and other records new to the ornithology of South Carolina, 437-442; notes on six Georgia birds from, 485.

Wetmore, Alexander, the birds of Desecheo Island, Porto Rico, 333– 340; notice of his 'The Relationship of the Fossil Bird Palaccheoides mioceanus, 251; notice of his 'Duck Sickness in Utah,' 490.

Whip-poor-will, 27, 300.

White, Francis B., Yellow-headed Blackbird at Ipswich, Mass., 224.

White, James Clarke, obituary notice of, 265.

Widgeon, European, 74, 75.

Willet, Western, 331.

Williams, Robert W., the Black Vulture (Catharista urubu) in Indiana, 477.

Wilmot, Nelson E., Mockingbird (Minus polyglottos polyglottos) spending the winter at West Haven, Conn., 229.

Wilson, Etta S., Bachman's Warbler and Solitary Sandpiper in Indiana, 228.

'Wilson Bulletin' reviewed, 99, 255, 376, 497.

Wilsonia, canadensis, 144, 229. citrina, 144. pusilla pileolata, 155.

Wisconsin, 74.

Wood, Norman A., notice of his 'Notes on the Birds of Alger County, Michigan,' 489.

Woodcock, 22.

Woodpecker, Arctic Three-toed, 48, 85, 299, 479.

Batchelder's, 48.

Downy, 27, 223, 236.

Hairy, 26.

Jamaica, 495.

Lewis', 49.

Northern Pileated, 27, 479.

Red-bellied, 27.

Red-headed, 27, 84, 232, 299, 341, 346.

Red-cockaded.

Rocky Mountain, Hairy, 48.

Three-toed, 48.

Western Pileated, 48.

White-headed, 48.

Woodruff, Frank M., notes from the Chicago area, 234.

Wren, Bewick's, 145, 483, 485.

Carolina, 145.

House, 145, 305.

Long-billed, Marsh, 146.

Rock, 156.

Short-billed, Marsh, 145, 284, 305.

Western House, 156, 349.

Western Marsh, 156. Winter, 145, 156.

Wright, A. A. and A. H., drinking sap by Sapsuckers and Hummingbirds, 79–80.

Wright, Horace W., Labrador Chickadee (Penthetes hudsonicus nigricans) in its return flight from the fall migration of 1916, 37-40; a Red-throated Loon on Chestnut Hill Reservoir, Boston, Mass., 219; a Robin which migrated tailless, 231; Blue-winged Warbler once more nesting in South Sudbury, Mass., 482.

Wyoming, 96, 493.

Xanthocephalus xanthocephalus, 81, 149, 224.

Xanthoura yncas yncas, 457.

Xenopicus albolarvatus, 48.

YELLOW-THROAT, Maryland, 144, 484.

Western, 155.

ZAMELODIA ludoviciana, 139, 282, 348, 359.

melanocephala, 153, 235. m. capitalis, 211.

Zappey, Walter Reaves, obituary notice of, 263.

Zenaida auriculata pallens, 446. zenaida lucida, 339.

Zenaidura macroura carolinensis, 23, 282, 344.

m. marginella, 44.

Zonotrichia albicollis, 138, 232, 280, 359.

gambelii, 210.

leucophrys gambeli, 151, 210, 321.

l. leucophrys, 342.

l. nuttalli, 321-326.

### ERRATA.

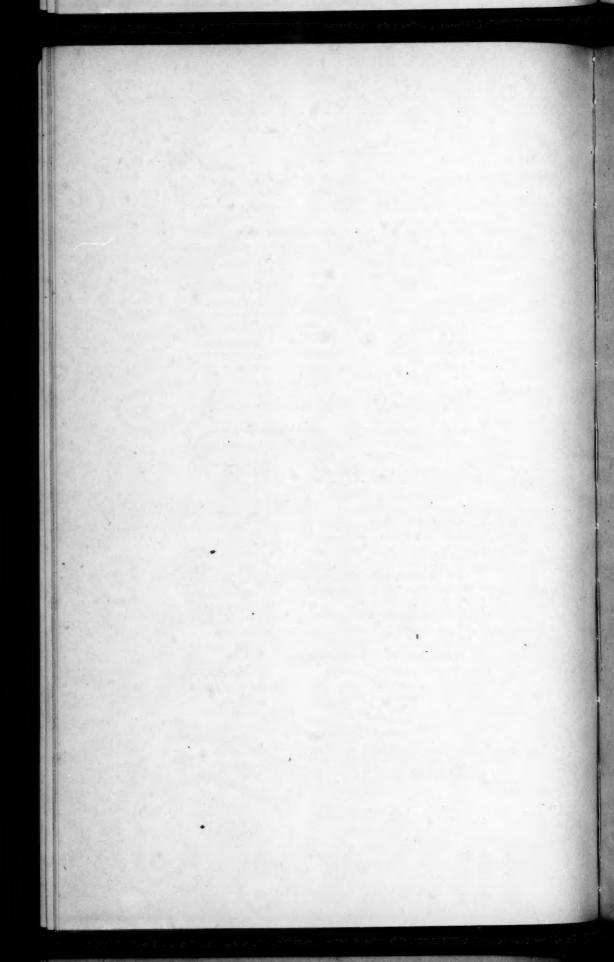
Page xxii, line 6 from bottom, after Gregory, Stephen S., for 1916, read 1906.

- " xxiii, " 10, for Harrison, Richard C., read Harrison, Richard E.
- " xxx, " 26, for Storer, Tracy Irvin read Storer, Tracy Irwin.
- 78, " 14, for Happy Eagle read Harpy Eagle.
- " 110, " 8 from bottom, for eighty-three read eighty-four.
- " 111, " 9, add "and Walter Faxon, 1896-1904."
- " 112, " 7, for Steinson read Stimson.
- " 112, " 16, omit (F).
- " 147, " 16, for last read first.
- " 235, " 15, for griseus read scolopaceus.
- " 268, " 17, for March 19, 1917 read May 19, 1917.
- " 269, " 9, omit Schaefer, V. F.
- " 347, " 31, for bimaculatus read australis.
- " 350, " 28, for Del Monte read Monterey.
- " 350, " 31, for B. M. read B. H.
- " 375, " 8, for Mable read Mabel.
- " 382, " 17, for Agnewo read Agnews.
- " 382, " 20, for Oct. 6, 1866 read Oct. 1, 1866.
- " 386, " 8, omit Wright, Horace Winslow.

#### DATES OF ISSUE.

Vol. XXXIV, No. 4 — October 10, 1917.

- " XXXV, No. 1 January 5, 1918.
- " XXXV, No. 2 April 6, 1918.
- " XXXV, No. 3 July 5, 1918.



## PUBLICATIONS OF THE

# AMERICAN ORNITHOLOGISTS' UNION

#### FOR SALE AT THE FOLLOWING PRICES:

- The Auk. Complete set, Volumes I-XXXII, (1884-1916) in original covers, \$111.00. Volumes I-VI are sold only with complete sets, other volumes, \$3.00 each; 75 cents for single numbers.
- Index to The Auk (Vols. I-XVII, 1884-1900) and Bulletin of the Nuttall Ornithological Club (Vols. I-VIII, 1876-1883), 8vo, pp. vii + 426, 1908. Cloth, \$3.75 post-paid; paper, \$3.25.
- Index to The Auk (Vols. XVIII-XXVII, 1901-1910), 8vo, pp. xviii +250, 1915. Cloth, \$3.00; paper, \$2.00.
- Check-List of North American Birds. Third edition, revised. 1910. Cloth, 8vo, pp. 426, and 2 maps. \$3.00. Second edition, revised, 1895. Cloth, 8vo, pp. xi + 372. \$1.15. Original edition 1886. Out of print.
- Abridged Check-List of North American Birds. 1889. (Abridged and revised from the original edition). Paper, 8vo, pp. 71, printed on one side of the page. 25 cents.
- Pocket Check-List of North American Birds. (Abridged from the third edition). Flexible cover,  $3\frac{1}{4} \times 5\frac{3}{4}$  inches. 30 cents.
- Code of Nomenclature. Revised edition, 1908. Paper, 8vo, pp. lxxxv. 50 cents.
  Original edition, 1892. Paper, 8vo, pp. iv + 72. 25 cents.
- A. O. U. Official Badge. An attractive gold and blue enamel pin, with Auk design, for use at meetings or on other occasions. Post-paid 50 cents.

Address JONATHAN DWIGHT

134 W. 71st St.,

New York, N. Y.

# Meetings of the American Ornithologists' Union

Since its organisation in 1883 the American Ornithologists' Union has held one special and 34 annual meetings.

These meetings have been held in six cities: 11 in New York, 10 in Washington, 7 in Cambridge (including 1 in Boston), 5 in Philadelphia, and 2 (one special) in San Francisco. Twenty-seven meetings have been held in November and eight in other months.

The number of Fellows (known as Active Members prior to 1902) has always been limited to 50 and the number present at any meeting has varied from 7 to 28. The attendance of other classes of members in recent years averages over 100.

Meeting	Date	Place . Sandara	Fellows, Present	Total Meim- bershp
1	1883, Sept. 26-28	1st New York	21	23
2	1884, Sept. 30-Oct. 2	2d New York	16	143
3	1885, Nov. 17-18	3d New York	16	201
4	1886, Nov. 16-18	1st Washington	20	251
5	1887, Oct. 11-13	1st Boston	17	284
6	1888, Nov. 13-15	2d Washington	20	298
7	1889, Nov. 12-15	4th New York	20	400
8	1890, Nov. 18-20	3d Washington	20	465
9	1891, Nov. 17-19	5th New York	14	493
10	1892, Nov. 15-17	4th Washington	20	557
11	1893, Nov. 20-23	2d Cambridge	17	582
12	1894, Nov. 12-15	6th New York	15	616
13	1895, Nov. 11-14	5th Washington	19	667
14	1896, Nov. 9-12	3d Cambridge	14	673
15	1897, Nov. 8-11	7th New York	18	679
16	1898, Nov. 14-17	6th Washington	21	695
17	1899, Nov. 13-16	1st Philadelphia	16	744
18	1900, Nov. 12-15	4th Cambridge	19	748
19	1901, Nov. 11-14	8th New York	18	738
20	1902, Nov. 17-20	7th Washington	25	753
20a	1903, May 15-16	1st San Francisco	a 7	
21	1903, Nov. 16-19	2d Philadelphia	19	775
22	1904, Nov. 28-Dec. 1	5th Cambridge	17	808
23	1905, Nov. 13-16	9th New York	17	860
24	1906, Nov. 12-15	8th Washington	24	750
25	1907, Dec. 9-12	3d Philadelphia	20	850
26	1908, Nov. 16-19	6th Cambridge	17	888
27	1909, Dec. 6-9	10th New York	19	866
28	1910, Nov. 14-17	9th Washington	23	897
29	1911, Nov. 13-16	4th Philadelphia	18	887
30	1912, Nov. 11-14	7th Cambridge	18	929
31	1913, Nov. 10-13	11th New York	28	992
32	1914, Apr. 6-9	10th Washington	27	1101
33	1915, May 17-20	2d San Francisco	11	1156
34	1916, Nov. 13-16	5th Philadelphia	26	830*
35	1917, Nov. 12-15	8th Cambridge	21	891

The next regular meeting — the 36th Stated — will be held at New York, Nov. 12–14, 1918.

\* Decrease due largely to change from Spring to Fall leaving 18 months without an election.

